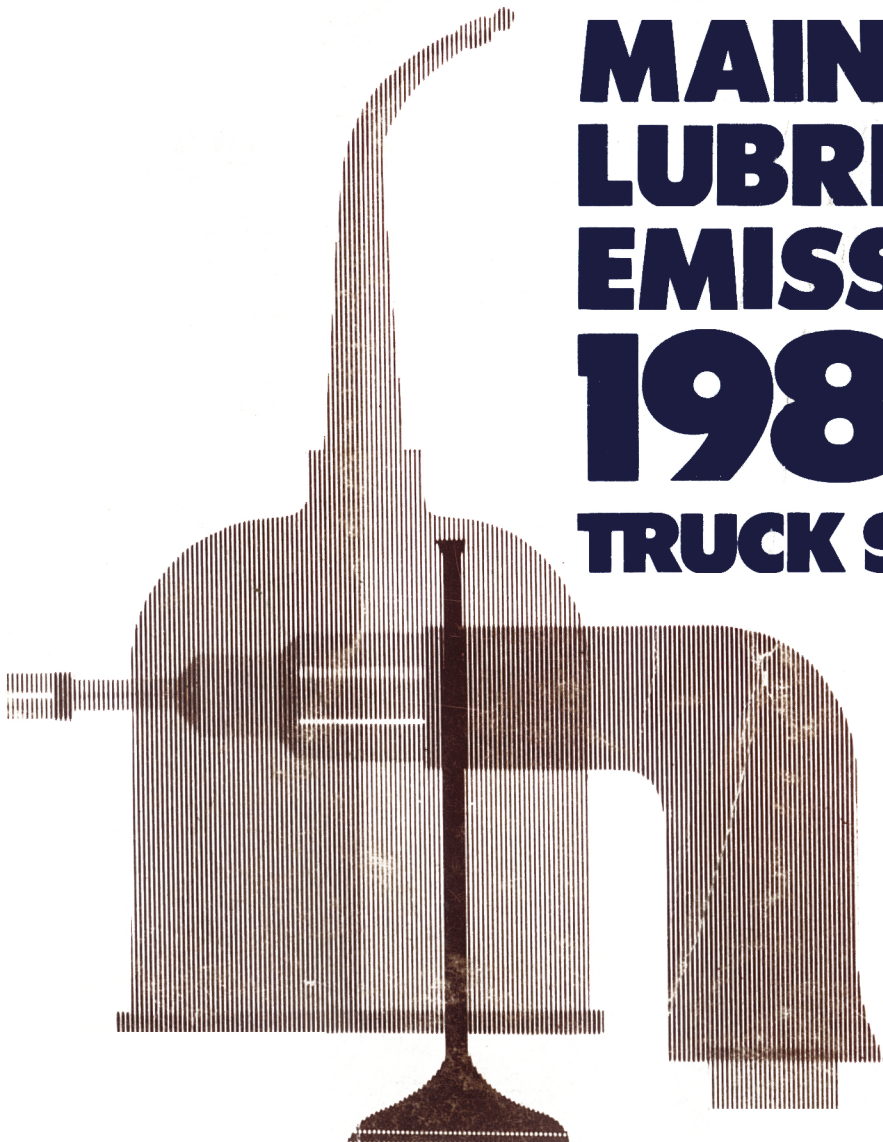


LIGHT MEDIUM HEAVY

**PRE-DELIVERY
MAINTENANCE
LUBRICATION
EMISSIONS
1980
TRUCK SHOP MANUAL**



ALL SERIES



GROUP AND PART INDEX

GROUP TITLE	PART TITLE	PAGE	GROUP TAB LOCATOR
INDEX	ALPHABETICAL INDEX OF MAJOR TITLES		
METRICS	METRIC FASTENER INFORMATION AND CONVERSION CHARTS		
PRE-DELIVERY, MAINTENANCE AND LUBRICATION GROUP 50	BODY50-41-1 BRAKES50-12-1 CHARGING SYSTEM50-31-1 COOLING SYSTEM50-27-1 DRIVING AXLES AND DRIVESHAFT50-15-1 ENGINE — Diesel50-22-1 — Gasoline50-21-1 ENGINE EMISSION CONTROL SYSTEMS50-29-1 EXHAUST SYSTEMS50-26-1 FUEL SYSTEMS — GASOLINE50-24-1 HOISTING, JACKING AND TOWING50-04-1 IDENTIFICATION CODES50-00-1 IGNITION SYSTEMS50-23-1 LIGHTS, INSTRUMENTS, CONTROLS, HEATING, AIR CONDITIONING AND ACCESSORIES50-32-1 LUBRICATION CHARTS AND LUBRICANT SPECIFICATIONS50-03-1 PRE-DELIVERY AND NON-EMISSION SYSTEM MAINTENANCE SCHEDULES ...50-02-1 STEERING50-13-1 SUSPENSION50-14-1 TRANSMISSION — Automatic50-17-1 — Clutch and Manual50-16-1 WHEELS AND TIRES50-11-1		

IMPORTANT SAFETY NOTICE

Appropriate service methods and proper repair procedures are essential for the safe, reliable operation of all motor vehicles as well as the personal safety of the individual doing the work. This Shop Manual provides general directions for accomplishing service and repair work with tested, effective techniques. Following them will help assure reliability.

There are numerous variations in procedures, techniques, tools, and parts for servicing vehicles, as well as in the skill of the individual doing the work. This Manual cannot possibly anticipate all such variations and provide advice or cautions as to each. Accordingly, anyone who departs from the instructions provided in this Manual must first establish that he compromises neither his personal safety nor the vehicle integrity by his choice of methods, tools or parts.

NOTES, CAUTIONS, AND WARNINGS

As you read through the procedures, you will come across NOTES, CAUTIONS, and WARNINGS. Each one is there for a specific purpose. NOTES give you added information that will help you to complete a particular procedure. CAUTIONS are given to prevent you from making an error that could damage the vehicle. WARNINGS remind you to be especially careful in those areas where carelessness can cause personal injury. The following list contains some general WARNINGS that you should follow when you work on a vehicle.

- Always wear safety glasses for eye protection.
- Use safety stands whenever a procedure requires you to be under the vehicle.
- Be sure that the ignition switch is always in the OFF position, unless otherwise required by the procedure.
- Set the parking brake when working on the vehicle. If you have an automatic transmission, set it in PARK. If you have a manual transmission, it should be in REVERSE.
- Operate the engine only in a well-ventilated area to avoid the danger of carbon monoxide.
- Keep yourself and your clothing away from moving parts, when the engine is running, especially the fan and belts.
- To prevent serious burns, avoid contact with hot metal parts such as the radiator, exhaust manifold, tail pipe, catalytic converter and muffler.
- Do not smoke while working on the vehicle.
- To avoid injury, always remove rings, watches, loose hanging jewelry, and loose clothing before beginning to work on a vehicle.

foreword . . .

This 1980 Truck Shop Manual has been prepared to provide information covering Pre-Delivery, Maintenance and Lubrication service repairs for the 1980 Bronco, Econoline (E-100 through E-350), F-100 through F-350, and F-, B-, C-, L-600 through 9000 Series (except CL-9000) Ford Trucks manufactured in the United States and Canada.

Body, Chassis, Electrical, and Engine service repairs are covered in the 1980 Light Truck Body, Chassis, and Electrical Shop Manual, 1980 Medium/Heavy Truck Body, Chassis and Electrical Shop Manual, and the 1980 Truck Engine Manuals.

For easy reference, information in this manual has been divided into smaller sections or Parts. There is one Part for each component in the system. In general, each Part contains the Pre-Delivery, Maintenance and Lubrication procedures for the component covered in the Part. In most cases, specifications are included at the end of each Part.

To aid in locating specific items in this manual, use the Alphabetical Subject index in the back of the manual or the Group and Part index on the following page. The tab locator on the right side of this Group and Part Index will help you find the first page of each Group.

The first page of each Part contains an index to locate service operations covered in that Part. The Group-Part breakdown is also indicated in the page number located at the top of each page.

Example: 50-02-21 = (Group) 50 — (Part) 02 — (Page) 21

The descriptions and specifications in this manual were in effect at the time this manual was approved for printing. Ford Motor Company reserves the right to discontinue models at any time, or change specifications or design without notice and without incurring obligation.



Ford Parts and Service Division
Training and Publications Department

METRICS

SUBJECT	PAGE	SUBJECT	PAGE
Decimal/Metric Equivalents		Strength Identification	
Chart	5	Bolts	2
English/Metric Conversion		Hex Nuts	3
Chart	4	Studs	3
Introduction	1	Tapping Screws	3
Nomenclature for Bolts	2	Thread Forming Screws	3
		U-Nuts	3
		Torque Conversion Chart	6

INTRODUCTION

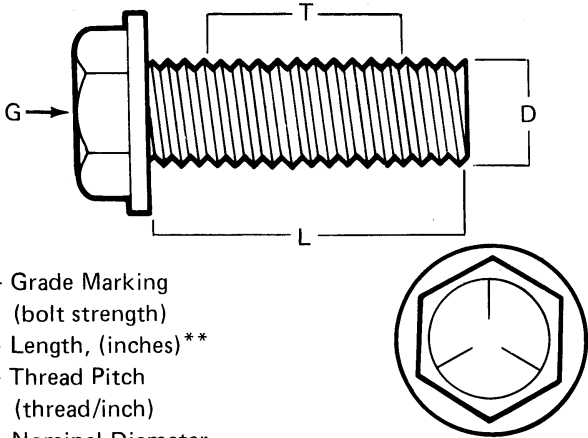
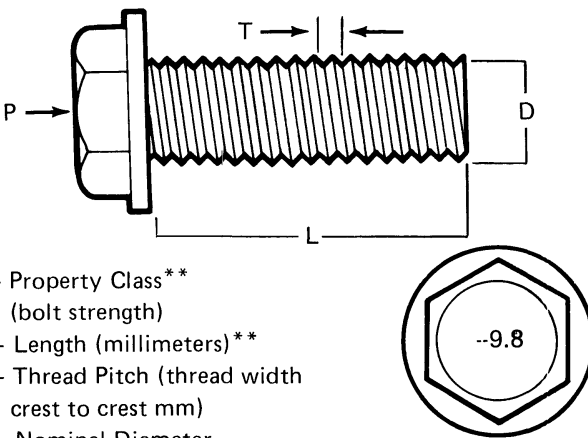
Most threaded fasteners are covered by specifications that define required mechanical properties, such as tensile strength, yield strength, proof load and hardness. These specifications are carefully considered in initial selection of fasteners for a given application. To assure continued satisfactory vehicle performance, replacement fasteners used should be of the correct strength, as well as the correct nominal diameter, thread pitch, length, and finish.

Most original equipment fasteners (English system or metric) are identified with markings or numbers indicating the strength of the fastener. These markings are described in the pages that follow. Attention to these markings is important in assuring that the proper replacement fasteners are used.

Further, some metric fasteners, especially nuts, are colored blue. This metric blue identification is in most cases a temporary aid for production start-up, and color will generally revert to normal black or bright after start-up.

English system and metric system fasteners are available through your Ford Parts and Service operation.

NOMENCLATURE FOR BOLTS

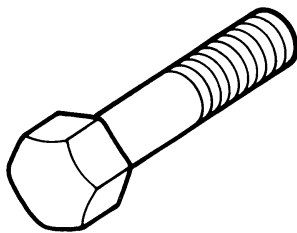
(ENGLISH) INCH SYSTEM Bolt, 1/2-13x1	METRIC SYSTEM Bolt M12-1.75x25
 G- Grade Marking (bolt strength) L- Length, (inches)** T- Thread Pitch (thread/inch) D- Nominal Diameter (inches)	 P- Property Class** (bolt strength) L- Length (millimeters)** T- Thread Pitch (thread width crest to crest mm) D- Nominal Diameter (millimeters)

*The property class is an Arabic numeral distinguishable from the slash SAE English grade system.

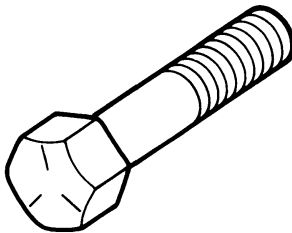
**The length of all bolts is measured from the underside of the head to the end.

BOLT STRENGTH IDENTIFICATION

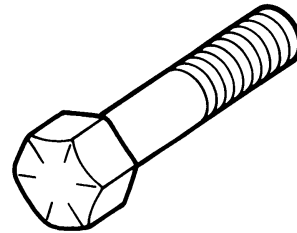
(ENGLISH) INCH SYSTEM



Grade 1 or 2



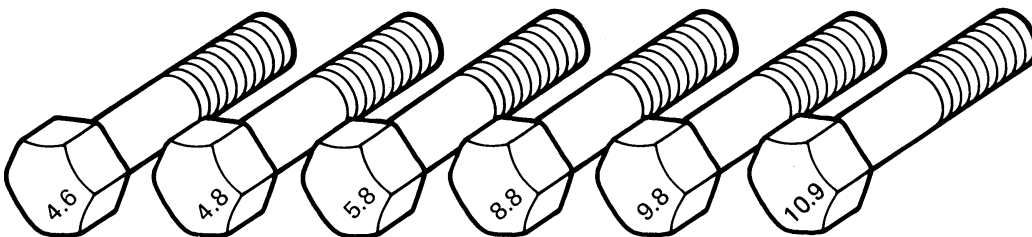
Grade 5



Grade 8

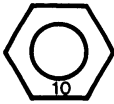
(English) Inch bolts - Identification marks correspond to bolt strength - increasing number of slashes represent increasing strength.

METRIC SYSTEM



Metric bolts - Identification class numbers correspond to bolt strength - increasing numbers represent increasing strength. Common metric fastener bolt strength property are 9.8 and 10.9 with the class identification embossed on the bolt head.

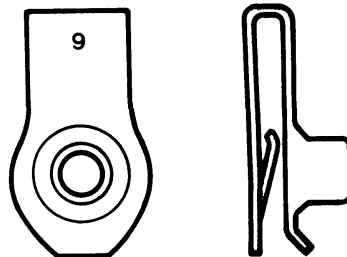
HEX NUT STRENGTH IDENTIFICATION

(ENGLISH) INCH SYSTEM		METRIC SYSTEM	
Grade	Identification	Class	Identification
Hex Nut Grade 5	 3 Dots	Hex Nut Property Class 9	 Arabic 9
Hex Nut Grade 8	 6 Dots	Hex Nut Property Class 10	 Arabic 10
Increasing dots represent increasing strength.		May also have blue finish or paint daub on hex flat. Increasing numbers represent increasing strength.	

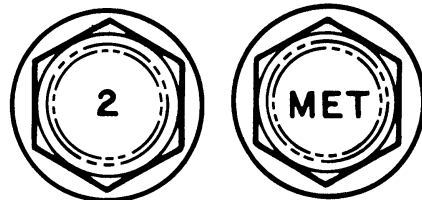
OTHER TYPES OF PARTS

Metric identification schemes vary by type of part, most often a variation of that used of bolts and nuts. Note that many types of English and metric fasteners carry no special identification if they are otherwise unique.

—Stamped “U” Nuts



—Tapping, thread forming and certain other case hardened screws



—Studs, Large studs may carry the property class number. Smaller studs use a geometric code on the end.



DECIMAL AND METRIC EQUIVALENTS

Fractions	Decimal In.	Metric mm.	Fractions	Decimal In.	Metric mm.
1/64	.015625	.397	33/64	.515625	13.097
1/32	.03125	.794	17/32	.53125	13.494
3/64	.046875	1.191	35/64	.546875	13.891
1/16	.0625	1.588	9/16	.5625	14.288
5/64	.078125	1.984	36/64	.578125	14.684
3/32	.09375	2.381	19/32	.59375	15.081
7/64	.109375	2.778	39/64	.609375	15.478
1/8	.125	3.175	5/8	.625	15.875
9/64	.140625	3.572	41/64	.640625	16.272
5/32	.15625	3.969	21/32	.65625	16.669
11/64	.171875	4.366	43/64	.671875	17.066
3/16	.1875	4.763	11/16	.6875	17.463
13/64	.203125	5.159	45/64	.703125	17.859
7/32	.21875	5.556	23/32	.71875	18.256
15/64	.234375	5.953	47/64	.734375	18.653
1/4	.250	6.35	3/4	.750	19.05
17/64	.265625	6.747	49/64	.765625	19.447
9/32	.28125	7.144	25/32	.78125	19.844
19/64	.296875	7.54	51/64	.796875	20.241
5/16	.3125	7.938	13/16	.8125	20.638
21/64	.328125	8.334	53/64	.828125	21.034
11/32	.34375	8.731	27/32	.84375	21.431
23/64	.359375	9.128	55/64	.859375	21.828
3/8	.375	9.525	7/8	.875	22.225
25/64	.390625	9.922	57/64	.890625	22.622
13/32	.40625	10.319	29/32	.90625	23.019
27/64	.421875	10.716	59/64	.921875	23.416
7/16	.4375	11.113	15/16	.9375	23.813
29/64	.453125	11.509	61/64	.953125	24.209
15/32	.46875	11.906	31/32	.96875	24.606
31/64	.484375	12.303	63/64	.984375	25.003
1/2	.500	12.7	1	1.00	25.4

ENGLISH METRIC CONVERSION

	multiply	by	for equiv. no. of:
ACCELERATION	Foot/sec ²	0.304 8	meter/sec ² (m/s ²)
	Inch/sec ²	0.025 4	meter/sec ²
TORQUE	Pound-inch	0.112 98	newton-meters (N·m)
	Pound-foot	1.355 8	newton-meters
POWER	horsepower	0.746	kilowatts (kw)
PRESSURE or STRESS	inches of water	0.249 1	kilopascals (kPa)
	pounds/sq. in.	6.895	kilopascals (kPa)
ENERGY or WORK	BTU	1 055.	joules (J)
	foot-pound	1.355 8	joules (J)
	kilowatt-hour	3 600 000.	joules (J=one W's)
		or 3.6 x 10 ⁶	
LIGHT	foot candle	10.76	lumens/meter ² (lm/m ²)
FUEL PERFORMANCE	miles/gal	0.425 1	kilometers/liter (km/l)
	gal/mile	2.352 7	liters/kilometer (l/km)
VELOCITY	miles/hour	1.609 3	kilometer/hr. (km/h)
LENGTH	inch	25.4	millimeters (mm)
	foot	0.304 8	meters (m)
	yard	0.914 4	meters
	mile	1.609	kilometers (km)
AREA	inch ²	645.2	millimeters ² (mm ²)
		6.45	centimeters ² (cm ²)
	foot ²	0.092 9	meters ² (m ²)
	yard ²	0.836 1	meters ²
VOLUME	inch ³	16 387.	mm ³
		16.387	cm ³
	quart	0.016 4	liters(1)
	quart	0.946 4	liters
	gallon	3.785 4	liters
	yard ³	0.764 6	meters ³ (m ³)
MASS	pound	0.453 6	kilograms (kg)
	ton	907.18	kilograms (kg)
	ton	0.907	tonne (t)
FORCE	kilogram	9.807	newtons (N)
	ounce	0.278 0	newtons
	pound	4.448	newtons
TEMPERATURE	degree fahrenheit	(1°F 32) 1.8	degree Celsius

TORQUE CONVERSION

NEWTON METERS (N·m)	POUND-FEET (LB.-FT.)
1	0.7376
2	1.5
3	2.2
4	3.0
5	3.7
6	4.4
7	5.2
8	5.9
9	6.6
10	7.4
15	11.1
20	14.8
25	18.4
30	22.1
35	25.8
40	29.5
50	36.9
60	44.3
70	51.6
80	59.0
90	66.4
100	73.8
110	81.1
120	88.5
130	95.9
140	103.3
150	110.6
160	118.0
170	125.4
180	132.8
190	140.1
200	147.5
225	166.0
250	184.4

POUND-FEET (LB.-FT.)	NEWTON METERS (N·m)
1	1.356
2	2.7
3	4.0
4	5.4
5	6.8
6	8.1
7	9.5
8	10.8
9	12.2
10	13.6
15	20.3
20	27.1
25	33.9
30	40.7
35	47.5
40	54.2
45	61.0
50	67.8
55	74.6
60	81.4
65	88.1
70	94.9
75	101.7
80	108.5
90	122.0
100	135.6
110	149.1
120	162.7
130	176.3
140	189.8
150	203.4
160	216.9
170	230.5
180	244.0

Identification Codes

**PART
50-00**

APPLIES TO ALL MODELS

SUBJECT	PAGE	SUBJECT	PAGE
BUILD DATE STAMP LOCATIONS	50-00-3	VEHICLE DATA (Cont'd.)	
Light Truck	50-00-3	Engine Codes	50-00-7
M/H Truck	50-00-5	Exterior Paint Color Codes	50-00-9
GENERAL INFORMATION	50-00-1	Max. GVW Codes	50-00-10
Light Truck	50-00-1	Sequential Serial and Warranty	
M/H Truck	50-00-4	Number Codes	50-00-8
SAFETY COMPLIANCE		Transmission Codes	50-00-14
CERTIFICATION LABEL	50-00-1	Truck Series Codes	50-00-16
Light Truck	50-00-1	Type/GVW Codes	50-00-10
VEHICLE CERTIFICATION LABEL		Wheelbase Codes	50-00-9
M/H Truck	50-00-4	VEHICLE IDENTIFICATION NUMBER	
VEHICLE DATA	50-00-4	(VEHICLE AND WARRANTY)	
Light Truck	50-00-1	Light Truck	50-00-1
M/H Truck	50-00-4	M/H Truck	50-00-4
Assembly Plant Codes	50-00-8	VEHICLE RATING DECAL	
Axle Codes (Front)	50-00-16	M/H Truck	50-00-4
Axle Codes (Rear)	50-00-15		
Body Codes	50-00-9		
D.S.O. Codes	50-00-16		

GENERAL INFORMATION—LIGHT TRUCK

SAFETY COMPLIANCE CERTIFICATION LABEL

The Safety Compliance Certification Label is attached to the driver's door lock pillar (Figs. 1 and 2). The label contains the name of the manufacturer, the month and year of manufacture, the certification statement, and the Vehicle Identification Number. The label also contains Gross Vehicle Weight Rating and Gross Axle Weight Ratings, Wheel and Tire data, and information codes for additional vehicle data.

VEHICLE IDENTIFICATION NUMBER (VEHICLE SERIAL AND WARRANTY)

The identification number located in the lower center area of the Safety Compliance Certification Label (Figs. 1 and 2) is the same number as the vehicle Serial and Warranty number. The first letter and two numbers indicate the truck series code. The letter following the truck series code designates the engine identification code. The letter following the engine identification code indicates the assembly plant at which the vehicle was built. The remaining letters and numbers indicate the consecutive unit number. (Serial and Warranty number).

The charts that follow list the various vehicle identification number codes.

NOTE: The vehicle identification number will also be stamped on a metal tab that will be riveted to the instrument panel close to the windshield on the drivers side of the truck and will be visible from the outside.

VEHICLE DATA

The vehicle data appears on the Safety Compliance Certification Label on the second and third two lines following the identification number. The code set (two numbers or a number and a letter) above COLOR identify the exterior paint color (two sets of codes designate a two-tone). The three digits under W.B. designate the wheelbase in inches. The letter and three digits under TYPE/G.V.W. designate the truck model within a series and the gross vehicle weight rating. The letters and/or numeral under BODY designate the interior trim, seat and body type. The transmission installed in the vehicle is identified under TRANS by an alphabetical code. A letter and a number or two numbers under AXLE identify the rear

SAFETY COMPLIANCE CERTIFICATION LABELS COMPLETE VEHICLES

(UNITED STATES)

MFD. BY FORD MOTOR CO. IN U.S.A.

DATE: 8/79 GVWR: 7650 LB/3470 KG
 FRONT GAWR: 3050 LB REAR GAWR: 5300 LB
 1383 KG WITH 2404 KG WITH
 F78-15B TIRES F78-15B TIRES
 15x5.5 K RIMS 15x5.5 K RIMS
 AT 32 PSI COLD AT 32 PSI COLD

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE

VEHICLE IDENTIFICATION NO. F25GLGA0000

TYPE TRUCK

EXTERIOR PAINT COLORS DSO

WB	TYPE GVW	BODY	TRANS	AXLE
----	----------	------	-------	------

(CANADA)

MFD. BY FORD MOTOR CO. OF CANADA LTD.

DATE: GVWR:
 FRONT GAWR: REAR GAWR:
 WITH
 TIRES
 RIMS
 WITH
 TIRES
 RIMS

AT PSI COLD AT PSI COLD

THIS VEHICLE CONFORMS TO ALL APPLICABLE FEDERAL MOTOR VEHICLE SAFETY STANDARDS IN EFFECT ON THE DATE OF MANUFACTURE SHOWN ABOVE

VEH. IDENT. NO. CANADA BUILT UNITS
 TYPE UTILIZE SAME TYPE DATA
 AS U.S.A.

EXTERIOR PAINT COLORS DSO

WB	TYPE GVW	BODY	TRANS	AXLE
----	----------	------	-------	------

(QUEBEC)

FABR. AUX E-U PAR LA FORD MOTOR CO.

DATE: PNBV:
 PNBE AVANT: PNBE ARRIERE:
 AVEC
 «PNEUS»
 «JANTES»

A LB/PO² A FROID A LB/PO² A FROID

CE VEHICULE EST CONFORME A TOUTES LES NORMES FEDERALES DE SECURITE DES V.A. EN VIGUEUR A LA DATE DE FABR. INIQUEE CI-DESSUS.

N° D'IDENT.
 DU VEHICULE
 TYPE

FOR VEHICLES MFD IN U.S.A. FOR QUEBEC, CANADA.

FABR. PAR FORD DU CANADA LIMITEE

DATE: PNBV:
 PNBE AVANT: PNBE ARRIERE:
 AVEC
 «PNEUS»
 «JANTES»

A LB/PO² A FROID A LB/PO² A FROID

CE VEHICULE EST CONFORME A TOUTES LES NORMES FEDERALES DE SECURITE DES V.A. EN VIGUEUR A LA DATE DE FABR. INIQUEE CI-DESSUS.

N° D'IDENT.
 DU VEHICULE
 TYPE

COULEUR 4° COMM SPEC.

EMPATT.	TYPE/PSV	CARR	TRANS.	PONT
---------	----------	------	--------	------

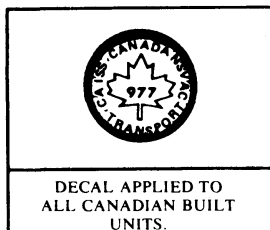
MADE IN CANADA

FOR VEHICLES MFD. IN CANADA FOR QUEBEC, CANADA.

INCOMPLETE VEHICLES

THE INCOMPLETE VEHICLE RATING DECAL IS INSTALLED ON THE DRIVER'S DOOR LOCK PILLAR IN PLACE OF THE SAFETY COMPLIANCE CERTIFICATION LABEL.

VEHICLE RATING DECAL



INCOMPLETE VEHICLE MANUFACTURED BY

GVWR: 3050 LB/1383 KG
 VEHICLE IDENTIFICATION NUMBER F27GLGA0001

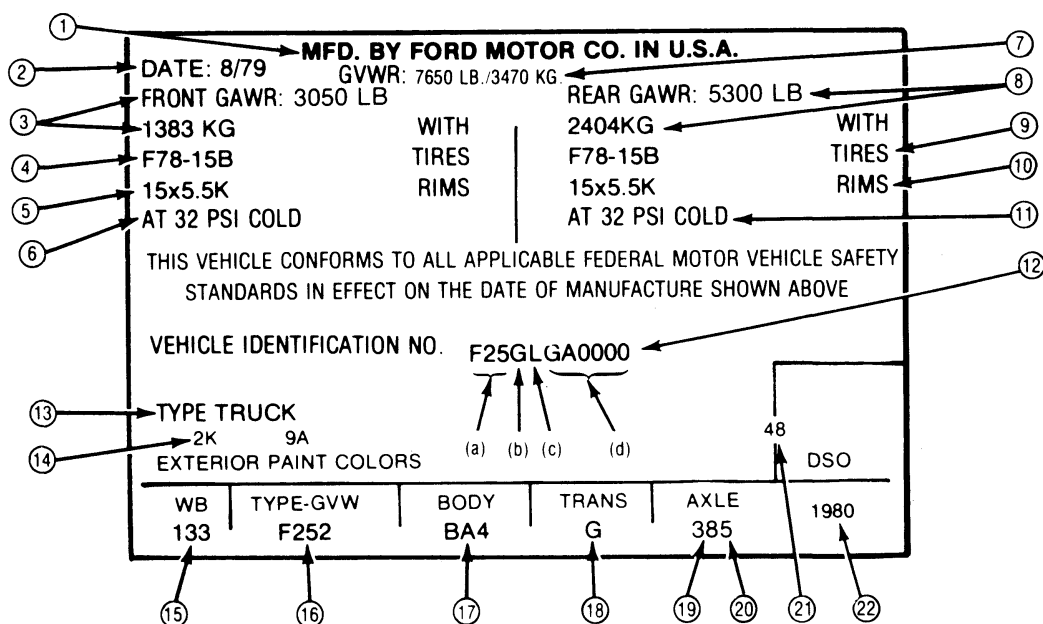
EXTERIOR PAINT COLORS 2H 48 DSO

WB	TYPE-GVW	BODY	TRANS	AXLE
----	----------	------	-------	------

133 F270 AB4 G 38 1980

FIG. 1 Typical Light Truck Vehicle Certification Labels

CY 1813-2C



- | | | |
|---|---|--|
| ① Name of Manufacturer | ⑧ Rear Gross Axle Weight Rating in Pounds (LB) and Kilograms (KG) | ⑬ Type Vehicle |
| ② Date of Manufacture | ⑨ Rear Tire Size | ⑭ Exterior Paint Codes (two sets of figures designates a two-tone) |
| ③ Front Gross Axle Weight Ratings in Pounds (LB) and Kilograms (KG) | ⑩ Rim Size | ⑮ Wheelbase in Inches |
| ④ Front Tire Size | ⑪ Rear Tire Cold PSI | ⑯ Model Code and GVW |
| ⑤ Rim Size | ⑫ Vehicle Identification Number | ⑰ Interior Trim, Seat and Body/Cab Type |
| ⑥ Front Tire Cold PSI | (a) Truck Series Code | ⑱ Transmission Code |
| ⑦ Gross Vehicle Weight Rating in Pounds (LB) and Kilograms (KG) | (b) Engine Code | ⑲ Rear Axle Code |
| | (c) Assembly Plant Code | ⑳ Front Axle Code if so Equipped |
| | (d) Sequential Serial and Warranty Number | ㉑ District/Special Order Codes |
| | | ㉒ Vehicle Model Year |

W1017-2N

FIG. 2 Typical Light Truck Safety Compliance Certification Label

axle ratio (when required, a letter is also stamped or number after the rear axle code to identify the front axle).

A two-digit number is stamped above D.S.O. to identify the district which ordered the vehicle. If the vehicle is built to special order (Domestic Special Order, Foreign Special Order, Limited Production Option, or other special order), the complete order number will also appear above D.S.O. The vehicle model year appears in the lower right corner area of the label under D.S.O. The charts that follow Fig. 2 list the various vehicle data codes.

BUILD DATE STAMP LOCATIONS

The vehicle build date stamp is located as follows: On Bronco, Light Trucks (F-100 through F-350), and Medium Trucks (600-700, 7000 Series) the vehicle build

date is stamped on the front surface of the radiator support on the passengers side of the vehicle. On Econoline vehicles (E-100 through E-350), the build date is stamped on top of the radiator support. Following is a sample of the four digit number that indicates the month and day of build:

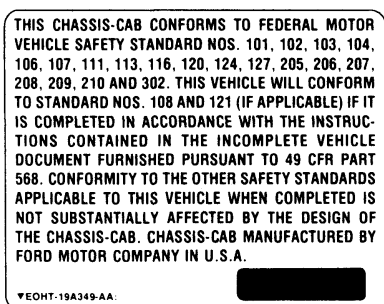
ACTUAL DATE OF BUILD	DATE STAMP ON VEHICLE
January 24	0124
October 21	1021

Yellow ink is used for the date stamp. When the marking surface is painted the body color, the date stamp will be marked in red ink. Units from the Ontario Truck Plant (Code C) will be marked with silver ink.

GENERAL INFORMATION—MEDIUM/HEAVY TRUCK

VEHICLE CERTIFICATION LABEL

The Vehicle Certification Label (V.C. Label) is attached to the rear face of the driver's door or door pillar (Fig. 3). The label contains the name of the manufacturer, the month and year of manufacture and the certification statement.



CA5084-1A

FIG. 3 Typical Medium/Heavy Truck Vehicle Certification Label

VEHICLE RATING DECAL

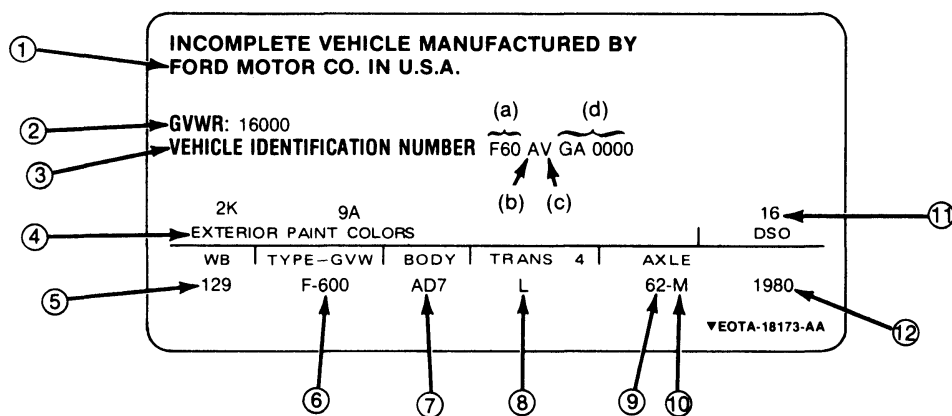
Fig. 4 illustrates a typical Vehicle Rating Decal. On cowl and windshield vehicles, the rating decal is mounted on the right side of the cowl top panel under the hood. On incomplete vehicles, the rating decal is attached to a booklet (Incomplete Vehicle Manual) and secured to a suitable interior location. On all other vehicles, the rating decal is mounted on the rear face of the left front door.

VEHICLE IDENTIFICATION NUMBER (VEHICLE SERIAL AND WARRANTY)

The identification number located in the center area of the Vehicle Rating Decal (Fig. 4), is the same number as the vehicle serial and warranty number. The first letter and two numbers indicate the truck series code. The letter following the truck series code designates the engine identification code. The letter following the engine identification code indicates the assembly plant at which the vehicle was built. The remaining letters and numbers indicate the consecutive unit number (serial and warranty number). The charts that follow list the various vehicle identification number codes.

VEHICLE DATA

The vehicle data appears on the Vehicle Rating Decal on the two lines following the identification



- | | |
|---|---|
| ① Name and Location of Manufacturer | ⑤ Wheelbase in Inches |
| ② Gross Vehicle Weight Rating in Pounds (LB) and Kilograms (KG) | ⑥ Model Code and GVW |
| ③ Vehicle Identification Number | ⑦ Interior Trim, Seat and Body/Cab Type |
| (a) Truck Series Code | ⑧ Transmission Code |
| (b) Engine Code | ⑨ Rear Axle Code |
| (c) Assembly Plant Code | ⑩ Front Axle Code |
| (d) Sequential Serial and Warranty Number | ⑪ District/Special Order Codes |
| ④ Exterior Paint Codes
(Two sets of figures designates a two-tone) | ⑫ Vehicle Model Year |

CA5085-2A

FIG. 4 Typical Medium/Heavy Truck Vehicle Rating Decal

number. The code set (two numbers or a number and letter) above COLOR identify the exterior paint color (two sets of codes designate a two-tone). The three digits under W.B. designate the wheelbase in inches. The letter and three digits under TYPE/G.V.W. designate the truck model within a series and the gross vehicle weight rating. The letters and/or numeral under BODY designate the interior trim, seat and body type. The transmission installed in the vehicle is identified under TRANS by an alphabetical code (if two symbols appear, the first identifies the auxiliary transmission, if so equipped, and the second symbol identifies the main transmission). A letter and a number or two numbers under AXLE identify the rear axle ratio (when required, a letter is also stamped after the rear axle code to identify the front axle).

A two-digit number is stamped above D.S.O. to identify the district which ordered the vehicle. If the vehicle is built to special order (Domestic Special Order, Foreign Special Order, Limited Production Option, or other special order), the complete order number will also appear above D.S.O. The vehicle model year appears

in the lower right corner area of the decal under D.S.O. The charts that follow Figure 2 list the various vehicle data codes.

BUILD DATE STAMP LOCATIONS

The vehicle build date stamp for Medium Trucks (600-700, 7000 series) is stamped on the front surface of the radiator support on the passengers side of the vehicle. Following is a sample of the four digit number that indicates the month and day of build:

ACUTAL DATE OF BUILD	DATE STAMP ON VEHICLE
January 24	0124
October 21	1021

Yellow ink is used for the date stamp. When the marking surface is painted the body color, the date stamp will be marked in red ink. Units from the Ontario Truck Plant (Code C) will be marked with silver ink.

APPLIES TO ALL MODELS TRUCK SERIES CODES

BRONCO		
Code	Description	
U15	U-150 (Wagon) 4x4	

E-100 THRU E-350		
Conventional Code	Super Code	Description
E-100 Series		
E01	—	E100 Club Wagon
E04	—	E100 Cargo Van
E05	—	E100 Window Van
E06	—	E100 Display Van
E-150 Series		
E11	S11	E150 Club Wagon
E14	S14	E150 Cargo Van
E15	S15	E150 Window Van
E16	S16	E150 Display Van
E-250 Series		
E21	S21	E250 Club Wagon
E24	S24	E250 Cargo Van
E25	S25	E250 Window Van
E26	S26	E250 Display Van
E-350 Series		
E31	S31	E350 Club Wagon
E34	S34	E350 Cargo Van
E35	S35	E350 Window Van
E36	S36	E350 Display Van
RV "Cutaway" and Chassis		
E37	—	E350 Cutaway
Commercial Cutaway and Chassis		
E37	—	E350 Cutaway
Parcel Delivery		
E38	—	E350 Cutaway

F-SERIES CONVENTIONAL — GAS		
Chassis Cab Code	Pick-Up Code	Basic Series
	F10	F100
	F14	F150 4x4
	F15	F150
F27	F25	F250
	F26	F250 4x4
F37	F35	F350
	F36	F350 4x4

F-SERIES SUPER CAB — GAS		
Chassis Cab Code	Pick-up Code	Basic Series
X16	X14	F150 4x4
	X15	F150
X27	X25	F250
X28	X26	F250 4x4
X37	X35	F350
	X36	F350 4x4

F-600 — CONVENTIONAL	
Code	Basic Series
F60	F600 (Gas)
F61	F600 (Gas)
K60	F600 4x2 (Diesel)
K61	F600 4x2 (Diesel)

B-600 COWL BUS	
Code	Basic Series
B60	B600 (Gas)
J60	B600 (Diesel)

F-700-7000 — CONVENTIONAL	
Code	Basic Series
F70	F700 (Gas)
F82	F800 (Gas)
K70	F7000 (Diesel)
K71	F7000 (Diesel)

B-700-7000 — CONVENTIONAL	
Code	Basic Series
B70	B700 (Gas)
B71	B700 (Gas)
J70	B7000 (Diesel)

L-SERIES — CONVENTIONAL	
Code	Basic Series
L-Series — Diesel	
A90	LT-900 (LTL 9000 DSO)
L-Series — Gas	
F80, F81	L800
F90, F91	L900
L-Series — Diesel	
K80	L8000
K81	L8000
K90	L9000

L-SERIES CONVENTIONAL (Continued)	
Code	Basic Series
LT-Series — Gas	
T80, T81	LT800
T90, T91	LT900
LT-Series — Diesel	
U80, U81	LT8000
U90, U91	LT9000
LTS-Series — Gas	
V80, V81	LTS800
V90, V91, V92	LTS900
LTS-Series — Diesel	
Y80, Y81	LTS8000
Y90, Y91, Y92	LTS9000

N-SERIES — SHORT CONVENTIONAL	
Code	Basic Series
N-Series — Gas	
N60	N600
N61, N62	N600
N70, N71	N700
N80, N81	N800
N90, N91	N900
N-Series — Diesel	
R70, R71	N7000
R80, R81	N8000
R90	N9000
NT-Series — Gas	
S80, S81	NT800
S90, S91	NT900
NT-Series — Diesel	
W80, W81	NT8000
W90, W91	NT9000

C-SERIES — LOW TILT CABS	
Code	Basic Series
C-Series — Gas	
C60	C600
C61	C600
C70	C700
C80	C800
C90, C91	C900
C-Series — Diesel	
D70	C7000
D80	C8000
CT-Series — Gas	
L80	CT300
L90, L91	CT900
CT-Series — Diesel	
Q80	CT8000

ENGINE CODES

ENGINE CODES

GAS ENGINE CODES — BRONCO			
Code	Engine CID	Liter	Cyl.
E	300-1V	4.9	6
F	302-2V	5.0	8
G	351-2V	5.8L	8

GAS ENGINE CODES — LT. TRUCK (F-100 thru F-350)			
Code	Engine CID	Liter	Cyl.
E	300-1V	4.9L	6
F	302-2V	5.0L	8
G	351-2V	5.8L	8
Z	400-2V	6.6L	8

GAS ENGINE CODES — E-100 THRU E-350 (Econoline and Club Wagon)			
Code	Engine CID	Liter	Cyl.
E	300-1V L.D.	4.9L	6
F	302-2V	5.0L	8
G*	351-2V	5.8L	8
Z	400-2V	6.6L	8
W#	351-2V	5.8L	8
L	460-4V	7.5L	8

E100 Windsor only — E150 Less Leaded Fuel

* E150 with Leaded Fuel — E250-E350.

GAS ENGINE CODES — MEDIUM TRUCK (F- and B-600)			
Code	Engine CID	Liter	Cyl.
C	370-2V	6.1L	8
A	370-4V	6.1L	8

GAS ENGINE CODES — EXPORT LOW COMP.			
Code	Engine CID	Liter	Cyl.
B	370-2V	6.1L	8
7	351-2V	5.8L	8

GAS ENGINE CODES — 700-900 SERIES AND N600-C600			
Code	Engine CID	Liter	Cyl.
H	370-2V	6.1	8
H	370-4V	6.1	8
H	370-2V	6.1	8 (Low Comp)
H	370-4V	6.1	8 (Low Comp)
H	370-2V	6.1	8 (L.P. Gas DSO)
H	370-4V	6.1	8 (L.P. Gas DSO)
K	429-4V	7.0	8
K	429-4V	7.0	8 (L.P. Gas DSO)
M	477-4V	7.8	8
8	DSO		

DIESEL ENGINE CODES — CATERPILLAR				
Code	CID	Model	H.P.	RPM
Y	636	3208	175 HP	2800
Y	636	3208	210 HP	2800
Y	636	3208	200 HP	2800
X	893	3406	280 HP	2100*
X	893	3406	290 HP	1900**
X	893	3406	325 HP	2100
9	Special Order Caterpillar DSO			

*1015 Torq.

**Economy

DIESEL ENGINE CODES — CUMMINS				
Code	CID	Model	H.P.	RPM
W	855	NTC230	230 HP	2100
W	855	NTC230	230 HP	1900*
W	855	NTC250	250 HP	2100
W	855	NTC250	250 HP	1900*
W	855	NTC290	290 HP	2100
W	855	NTC290	290 HP	1900*
W	855	NTC350	350 HP	2100
W	855	NTC350	350 HP	1900*
9	Special Order Cummins DSO			

*Formula

DIESEL ENGINE CODES — DETROIT					
Code	CID	Model	H.P.	RPM	Liter
J	426	67IN	228 HP	2100	7.0
N	500	DDA-990N	165 HP	3000	8.2
N	500	DDA-990T	205 HP	3000	8.2
R	552	6V-42TTA	270 HP	1950	9.0
T	568	8V71N	304 HP	2100	9.3
T	568	8V71T	350 HP	2100	9.3
T	568	8V71TTA	305 HP	1950	9.3
9	Special Order Detroit DSO				
Z	Special Order DSO				

ASSEMBLY PLANT AND SEQUENTIAL SERIAL AND WARRANTY NUMBER CODES

ASSEMBLY PLANT CODES

<u>Code</u>	<u>Assembly Plant</u>
B	Oakville
C	Ontario Truck
E	Mahwah
H	Lorain
K	Kansas City
L	Michigan Truck
N	Norfolk
P	Twin Cities
R	San Jose
S	Allen Park
U	Louisville
V	Kentucky Truck

SEQUENTIAL SERIAL AND WARRANTY NUMBER CODES (1980 MODEL YEAR)

Bronco, LT Truck (F-100 thru F-350)	
<u>Code</u>	<u>Month and Year</u>
GA0, 000 — GB9, 999	August, 1979*
GD0, 000 — GE9, 999	September, 1979
GG0, 000 — GH9, 999	October, 1979
GJ0, 000 — GK9, 999	November, 1979
HA0, 000 — HB9, 999	December, 1979
HD0, 000 — HE9, 999	January, 1980
HG0, 000 — HH9, 999	February, 1980
HJ0, 000 — HK9, 999	March, 1980
JA0, 000 — JB9, 999	April, 1980
JD0, 000 — JE9, 999	May, 1980
JG0, 000 — JH9, 999	June, 1980
JJ0, 000 — JK9, 999	July, 1980
KA0, 000 — KE9, 999	August, 1980

F- and B-600 (Kentucky Truck Plant)	
<u>Code</u>	<u>Month and Year</u>
GA0, 000 — GA4, 999	August, 1979*
GD0, 000 — GD4, 999	September, 1979
GG0, 000 — GG4, 999	October, 1979
GJ0, 000 — GJ4, 999	November, 1979
HA0, 000 — HA4, 999	December, 1979
HD0, 000 — HD4, 999	January, 1980
HG0, 000 — HG4, 999	February, 1980
HJ0, 000 — HJ4, 999	March, 1980
JA0, 000 — JA4, 999	April, 1980
JD0, 000 — JD4, 999	May, 1980
JG0, 000 — JG4, 999	June, 1980
JJ0, 000 — JJ4, 999	July, 1980
KA0, 000 — KA4, 999	August, 1980

E-100 thru E-350 (Econoline and Club Wagon)		
Code	Month and Year	
GA0, 000 — GB9, 999	August, 1979*	
GD0, 000 — GE9, 999	September, 1979	
GG0, 000 — GH9, 999	October, 1979	
GJ0, 000 — GK9, 999	November, 1979	
HA0, 000 — HB9, 999	December, 1979	
HD0, 000 — HE9, 999	January, 1980	
HG0, 000 — HH9, 999	February, 1980	
HJ0, 000 — HK9, 999	March, 1980	
JA0, 000 — JB9, 999	April, 1980	
JD0, 000 — JE9, 999	May, 1980	
JG0, 000 — JH9, 999	June, 1980	
JJ0, 000 — JK9, 999	July, 1980	
KA0, 000 — KE9, 999	August, 1980	
700 thru 9000 Series and N600 — C600		
Code	Month and Year	
GA5, 000 — GB9, 999	August, 1979*	
GD5, 000 — GE9, 999	September, 1979	
GG5, 000 — GH9, 999	October, 1979	
GJ5, 000 — GK9, 999	November, 1979	
HA5, 000 — HB9, 999	December, 1979	
HD5, 000 — HE9, 999	January, 1980	
HG5, 000 — HH9, 999	February, 1980	
HJ5, 000 — HK9, 999	March, 1980	
JA5, 000 — JB9, 999	April, 1980	
JD5, 000 — JE9, 999	May, 1980	
JG5, 000 — JH9, 999	June, 1980	
JJ5, 000 — JK9, 999	July, 1980	
KA5, 000 — KE9, 999	August, 1980	

*Job #1 — 1980 Model Year

CY1731-2E

WHEEL BASE, EXTERIOR PAINT CODES AND BODY TRIM CODES

WHEEL BASE (IN INCHES)

Bronco			
104			
F-100 Thru F-350			
117			
133	155		
137	161		
139			
E-100 Thru E-350 (Econoline and Club Wagon)			
124			
138			
158			
F- and B-600			
129	171	207	
141	177	217	
151	189	225	
153	193	237	
700 Thru 9000 Series and N600 — C600 Parcel			
099	146	174	203
111	148	175	204
124	150	176	206
134	153	181	212
135	154	184	220
136	155	185	222
137	158	186	236
138	161	187	242
143	162	188	250
144	166	194	260
	167	202	280

EXTERIOR PAINT COLOR CODE (2 CODES IF TWO TONED)

Refer to the Light Truck or the Medium-Heavy Truck, Body-Chassis and Electrical Shop Manuals, Group 10-00, for a complete listing of 1980 Truck Exterior Paint Codes.

BODY TRIM CODES

Refer to the Light Truck or the Medium-Heavy Truck, Body-Chassis and Electrical Shop Manuals (Group 10-00), for a complete listing of 1980 truck body trim codes.

TYPE G.V.W. AND MAX. G.V.W. CODES

BRONCO		
Code	G.V.W.	
U150	5450	
U151	5700	
U152	6050	
U153	6300	

F-100 (4x2)		
Pickup Code	Chassis Cab Code	G.V.W.
F100	—	4650
F101	—	4700
F102	—	5000
F103	—	5150

F-150 (4x2)		
Pickup Code	Chassis Cab Code	G.V.W.
F150	—	5250
F151	—	5450
F152	—	5850
F153	—	6100

F150 (4x2) SUPER CAB		
Pickup Code	Chassis Cab Code	G.V.W.
X150	—	5750
X151	—	5950
X152	—	6100
X153	—	6300

F-150 (4x4)		
Pickup Code	Chassis Cab Code	G.V.W.
F140	—	5600
F141	—	5800
F142	—	6150
F143	—	6350

F-150 (4x4) SUPER CAB		
Pickup Code	Chassis Cab Code	G.V.W.
X140	—	6400
X143	—	6600

F-250 (4x2)		
Pickup Code	Chassis Cab Code	G.V.W.
F250	F270	6350
F251	F271	6900
F252	F272	7650
F253	F273	7800

F-250 (4x2) SUPER CAB		
Pickup Code	Chassis Cab Code	G.V.W.
X250	—	6350
X251	—	6600
X252	—	7150
X253	—	7600
X254	—	7750
X255	—	7850
X256	—	8000

F-250 (4x4)		
Pickup Code	Chassis Cab Code	G.V.W.
F260	—	6760
F261	—	7350
F262	—	8000
F266	—	8400

F-250 (4x4) SUPER CAB		
Pickup Code	Chassis Cab Code	G.V.W.
X260	—	6950
X261	—	8200

F-350 (4x2)		
Pickup Code	Chassis Cab Code	G.V.W.
F350	—	8650
F351	—	8700
F352	—	9950
F353	—	10,000
—	F376	8800
—	F377	9200
—	F378	9500
—	F379	10,000

F-350 (4x4)		
Pickup Code	Chassis Cab Code	G.V.W.
F360	—	8850
F361	—	9250

F-350 (4x4) SUPER CAB		
Pickup Code	Chassis Cab Code	G.V.W.
X350	—	8900

E-100 CLUB, CUSTOM, AND CHATEAU WAGONS	
Conv. Code	G.V.W.
E010	5400
E011	5700
E012	5900
E013	5800
E014	6000

E-150 CLUB, CUSTOM, AND CHATEAU WAGONS			
Conv. Code	Super Code	Conv. G.V.W.	Super G.V.W.
E110	S110	6400	6100
E111	S111	6300	6200
E112	S112	6200	6400
E113	S113	6400	6600
E114	S114	6600	6200
E115	S115	6200	6400
E116	S116	6500	6600
E117	—	6400	—
E119	—	6600	—

E-250 CLUB, CUSTOM, AND CHATEAU WAGONS			
Conv. Code	Super Code	Conv. G.V.W.	Super G.V.W.
E210	S210	6800	6900
E211	S211	7100	7200
E212	S212	7400	7400
E213	S213	7600	7500
E214	S214	7900	7700
E215	S215	8100	7900
E216	S216	6900	8100
E217	S217	7100	6900
E218	S218	7300	7200
E219	S219	7500	7400
—	S21A	—	7500
—	S21B	—	7700
—	S21C	—	8000
—	S21D	—	8300
—	S21E	—	7500
—	S21F	—	7700
—	S21G	—	7900
—	S21H	—	8200
E21J	S21J	7700	8500
E21K	S21K	8200	7700
—	S21L	—	7900
—	S21M	—	8100
—	S21N	—	8200
—	S21P	—	8300
E21R	S21R	8600	8400
E21S	—	8800	—

E-350 CLUB, CUSTOM, AND CHATEAU WAGONS	
Code (Super)	G.V.W.
S310	8600
S311	8800
S312	8600
S313	8800
S314	9000
S315	8600
S316	8900
S317	9200
S318	8900
S319	9200
S31J	9400

TYPE/GVW AND MAX. GVW CODES — CONTINUED

E-100 ECONOLINE CARGO, WINDOW, AND DISPLAY VANS			
Conv. Cargo Code	Conv. Window Code	Conv. Display Code	G.V.W.
E040	E050	E060	5200
E041	E051	E061	5550

E-150 ECONOLINE CARGO, WINDOW, AND DISPLAY VANS							
Conv. Cargo Code	Super Cargo Code	Conv. Window Code	Super Window Code	Conv. Display Code	Super Display Code	G.V.W. (Conv.)	G.V.W. (Super)
E140	S140	E150	S150	E160	S160	6200	6050
E141	S141	E151	S151	E161	S161	6300	6200

E-250 ECONOLINE CARGO, WINDOW, AND DISPLAY VANS							
Conv. Cargo Code	Super Cargo Code	Conv. Window Code	Super Window Code	Conv. Display Code	Super Display Code	G.V.W. (Conv.)	G.V.W. (Super)
E240	S240	E250	S250	E260	S260	6750	6500
E241	S241	E251	S251	E261	S261	7500	7100
E242	S242	E252	S252	E262	S262	8250	7900

E-350 ECONOLINE CARGO, WINDOW, AND DISPLAY VANS							
Conv. Cargo Code	Super Cargo Code	Conv. Window Code	Super Window Code	Conv. Display Code	Super Display Code	G.V.W. (Conv.)	G.V.W. (Super)
E340	S340	E350	S350	E360	S360	8550	9000
E341	S341	E351	S351	E361	S361	9500	9300
E342	—	E352	—	E362	—	9750	—

E-350 RV CUTAWAY		E-350 PARCEL DELIVERY VAN	
Code	G.V.W.	Code	G.V.W.
E370	8700 Single Rear	E380	8700 Single Rear
E371	8800 Dual Rear	E381	8750 Dual Rear
E372	9700 Single Rear	E382	9700 Dual Rear
E373	10,250 Dual Rear	E383	10,000 Dual Rear
E374	11,000 Dual Rear		

E-350 COMMERCIAL CUTAWAY		E-350 COMMERCIAL STRIP (DSO)	
Code	G.V.W.	Code	G.V.W.
E37M	10,250 (DSO)	E37P	8650
E37N	10,900 (DSO)	E37Q	9600
E37W	8900 Single Rear	E37U	9550
E37X	9200 Dual Rear	E37V	9800
E37Y	9700 Dual Rear		
E37Z	9750 Dual Rear		

TYPE/GVW AND MAX. G.V.W. CODES

F-600	
Code	G.V.W.
F600	16,000
F602	19,200
F603	14,000
F604	16,000
F605	17,400
F606	17,400
F611	20,200
F612	21,000
F613	22,000
F614	22,000
F615	23,000
F616	24,000
F618	17,900 U-Haul
B-600 BUS	
B600	17,400
B601	19,200
B602	19,200
B610	19,700
B611	20,200
B613	21,000
B615	22,000
B617	24,500
B618	22,160
B619	23,160
B-700 BUS CHASSIS COWL — GAS	
B702	23,160
B705	25,080
B706	24,500
B707	25,250
B708	27,080
B709	26,500
B710	27,250
B-7000 BUS CHASSIS COWL — DIESEL	
J707	26,500
J708	27,250
J709	27,080
F-700 — GAS	
F701	21,000
F703	23,000
F704	24,000
F706	25,500
F707	25,000
F708	27,000
F709	27,500

F-800 — GAS	
F820	23,000
F821	25,000
F822	25,500
F823	27,000
F824	27,500
F825	29,000
F826	31,000
F827	32,000
F-7000 — DIESEL	
K703	23,000
K705	24,000
K706	25,500
K707	27,500
K708	25,000
K709	27,000
K710	21,000
L-800 — GAS	
F800	23,000
F801	25,000
F803	25,500
F804	27,500
F805	29,000
F806	31,000
F807	32,000
F808	34,000
F809	35,000
F811	31,800
F812	27,000
L-900 — GAS	
F900	25,500
F902	27,500
F905	31,000
F906	32,000
F908	34,000
F909	35,000
F912	23,100
F913	31,800
L-8000 — DIESEL	
K802	25,500
K803	27,500
K805	31,000
K806	32,000
K807	34,000
K808	35,000
K812	23,100
K813	31,800

L-9000 — DIESEL	
K902	32,000
K904	35,000
K907	28,000
K908	31,800
LT-800 — GAS	
T804	43,000
T806	46,000
T811	41,000
T812	44,800
LT-900 — GAS	
T900	39,000
T902	41,000
T904	43,000
T906	46,000
T907	50,000
T908	50,000
T911	60,000
T914	44,800
T915	48,000
T916	52,000
T917	58,000
LT-8000 — DIESEL	
U800	39,000
U805	46,000
U806	50,000
U807	50,000
U808	54,000
U809	60,000
U810	55,000
U811	56,000
U812	62,000
U815	41,000
U816	44,800
U817	61,000
LT-9000 — DIESEL	
U900	43,000
U903	46,000
U904	50,000
U905	50,000
U906	54,000
U908	60,000
U911	52,000
U912	62,000
U913	72,000
U914	44,800
U915	61,000
U916	48,000
U918	74,000
U919	76,000

LTS-800 — GAS	
Code	G.V.W.
V804	46,000
V809	41,000
V810	44,000
LTS-900 — GAS	
V900	39,000
V904	46,000
V905	50,000
V906	50,000
V907	52,000
V908	54,000
V909	56,000
V911	58,000
V912	60,000
V913	62,000
V914	64,000
V915	61,000
V918	41,000
V920	48,000
LT-9000 — GAS	
A900	44,800
A901	46,000
A902	48,000
A903	50,000
A904	50,000
A905	52,000
A906	54,000
A907	58,000
A908	60,000
LTS-9000 — GAS	
Y900	44,800
Y903	50,000
Y904	50,000
Y905	52,000
Y906	54,000
Y907	56,000
Y908	61,000
Y909	58,000
Y910	60,000
Y911	62,000
Y914	74,000
Y915	76,000
Y916	78,000
Y917	77,100
Y918	70,000
Y919	48,000
Y920	79,100
Y921	81,100

TYPE/GVW AND MAX. G.V.W. CODES — (CONTINUED)

LTS-8000 — DIESEL	
Code	G.V.W.
Y800	39,000
Y804	46,000
Y805	50,000
Y806	50,000
Y807	52,000
Y808	54,000
Y812	60,000
Y814	64,000
Y815	55,000
Y816	56,000
Y817	61,000
Y818	41,000
Y819	62,000
N-600 — GAS	
N601	16,500
N602	19,500
N603	21,500
N604	20,500
N612	23,000
N615	24,000
N620	22,000
N-700 — GAS	
N702	23,000
N704	25,500
N705	27,000
N706	27,500
N707	25,000
N710	21,000
N712	24,000
N-800 — GAS	
N800	23,000
N801	25,000
N803	25,500
N804	27,500
N805	29,000
N806	31,000
N807	27,000
N808	34,000
N813	31,800
N814	32,000
N815	35,000
N-900 — GAS	
N900	25,500
N902	27,500
N905	31,000
N906	32,000
N908	34,000
N909	35,000
N911	23,100
N912	31,800
N-7000 — GAS	
Code	G.V.W.
R702	23,000
R704	25,500

N-7000 — GAS (Continued)	
Code	G.V.W.
R705	25,000
R707	27,500
R708	27,000
R710	21,000
R712	24,000
N-8000 — GAS	
R802	25,500
R803	27,500
R805	31,000
R806	32,000
R807	34,000
R808	35,000
R810	23,100
R811	31,800
N-9000 — GAS	
R902	32,000
R904	35,000
R906	28,000
R907	31,800
NT-800 — GAS	
S804	43,000
S806	46,000
S811	41,000
S812	44,800
NT-900 — GAS	
S900	39,000
S902	41,000
S904	43,000
S906	46,000
S909	54,000
S914	44,800
S915	48,000
S916	52,000
NT-8000 — DIESEL	
W800	39,000
W803	56,000
W804	62,000
W805	46,000
W806	50,000
W807	50,000
W808	54,000
W812	41,000
W814	44,800
W815	55,000
W816	60,000
W817	61,000
NT-9000 — DIESEL	
Code	G.V.W.
W903	46,000
W904	50,000
W906	54,000
W907	43,000

NT-9000 — DIESEL (Continued)	
Code	G.V.W.
W910	58,000
W911	44,800
W912	48,000
W913	52,000
W914	60,000
W915	62,000
W916	72,000
W917	74,000
W918	76,000
C-600 — GAS	
C602	17,000
C612	23,000
C613	24,000
C617	21,200
C-700 — GAS	
C700	24,000
C701	25,000
C702	25,500
C703	27,000
C704	27,500
C705	21,000
C707	23,000
C-800 — GAS	
C802	27,500
C803	31,000
C804	34,000
C807	25,100
C-900 — GAS	
Code	G.V.W.
C904	27,500
C906	31,000
C907	32,000
C910	34,000
C912	37,000
C914	25,100
C915	39,000
C-7000 — DIESEL	
D701	21,000
D702	25,500
D703	24,000
D704	25,000
D705	27,500
D706	27,000
D708	23,000
C-8000 — DIESEL	
D802	27,500
D804	37,000
D805	39,000
D806	25,100

C-8000 — DIESEL (Continued)	
Code	G.V.W.
D807	32,000
D808	35,000
CT-800 — GAS	
L801	42,860
L802	51,000
L803	44,000
L804	52,000
L805	45,000
L807	46,000
L808	48,000
L809	50,000
CT-900 — GAS	
L901	42,860
L902	44,000
L903	45,000
L904	51,000
L905	52,000
L906	55,000
L907	56,000
L914	46,000
L915	48,000
L916	50,000
L917	52,000
L918	54,000
L919	50,000
CT-8000 — DIESEL	
Q801	42,860
Q802	51,000
Q803	45,000
Q804	44,000
Q805	41,000
Q806	52,000
Q807	46,000
Q808	48,000
Q809	50,000

TRANSMISSION CODES

BRONCO AND F-100 THRU F-350

Code	Description
G	Automatic (Bronco)
C	Ford Manual 3-Speed
F	Warner 4-Speed Manual
A	New Process 4-Speed Manual
B	Clark Manual 4-Speed Overdrive
J	Automatic C4 (F-100/150)
K	Automatic C6 (F-100/350)
X	Automatic C-6 (Fleet Only)
Econoline — Club Wagon	
C	3-Speed Manual
G	Cruisomatic
B	Clark Manual 4-Speed Overdrive

F & B-600

Code	Description
L	Automatic Allison AT540
P	Warner T-19 4-Speed
2	Clark 282-V Direct 5-Speed
M	Clark 285-V Direct 5-Speed
A	New Process 435 Direct 4-Speed
9	New Process 542-FD Direct 5-Speed
O	New Process 542-FL Direct 5-Speed
W	Clark 282 VHD 5-Speed
X	Clark 285 VHD 5-Speed
D	Spicer 5052A 5-Speed
E	Spicer 5252A 5-Speed

AUXILIARY TRANSMISSION

FORD HEAVY AND EXTRA-HEAVY TRUCK — PARCEL

French Labels			
California Emission			
	Code	Description	
D	M	4	Auxiliary Transmission Spicer 7231D
H	Q	8	Auxiliary Transmission Spicer 7041
G	P	7	Auxiliary Transmission Spicer R8341L
B	K	2	Power Takeoff
C	L	3	Power Takeoff & Auxiliary Transmission Spicer 7231D
E	N	5	Power Takeoff & Auxiliary Transmission Spicer 7041
F	O	6	Power Takeoff & Auxiliary Transmission Spicer R8341L

NOTE: When required, the auxiliary transmission code will be stamped directly in front of the transmission code.

700 THRU 9000 SERIES AND N600-C600

Code	Description
AA	Allison AT-540 Automatic
AB	Allison MT-643 Automatic
AC	Allison MT-653 Automatic
CA	Clark 280 5-Speed
CB	Clark 282 5-Speed
CC	Clark 282 VHD 5-Speed
CD	Clark 285 5-Speed
CE	Clark 285 VHD 5-Speed
CF	Clark 390 5-Speed
CG	Clark 397 5-Speed
FA	Fuller RT-610 10-Speed
FB	Fuller RT-613 13-Speed
FC	Fuller T-905A 5-Speed
FD	Fuller T-905B 5-Speed
FE	Fuller RT-906 6-Speed
FF	Fuller RT-910 10-Speed
FG	Fuller RTO-910 10-Speed O/D
FH	Fuller RTO-958LL 8-Speed
FI	Fuller RT-1110 10-Speed
FJ	Fuller RT-9509A 9-Speed
FK	Fuller RT9513 13-Speed
FL	Fuller RTO-9513 13-Speed O/D
FM	Fuller RT-12510 10-Speed
FN	Fuller RTO-12513 10-Speed O/D
NA	New Process NP-435 4-Speed
NB	New Process NP-542-FD 5-Speed
NC	New Process NP-542-FL 5-Speed
SA	Spicer SST-1007-3A 6-Speed
SB	Spicer CM-5052A 5-Speed
SC	Spicer CM-5252A 5-Speed
SD	Spicer CM-6052A 5-Speed
SE	Spicer CM-6052B 5-Speed
SF	Spicer CM-6052C 5-Speed
SG	Spicer RP-85163-A 16-Speed
RR	Delete Transmission (Glider)
WA	Warner T-19 4-Speed

AXLE CODES (REAR)

Bronco and F-100 thru F-350

Code	Description	#Capacity	Ratio
06	Ford	2900	2.75
14	Ford	3750	3.00
15	Ford	3750	3.25
16	Ford	3750	3.50
13	Ford	3750	2.75
12	Ford	3750	4.11
H3		3750	2.75
H2	Limited Slip	3750	3.50
H9	Limited Slip	3750	4.11
H4	Limited Slip	3750	3.25
23	Dana 61	5300	3.31
22	Dana 61	5300	3.07
24	Dana 60	5300	4.10
37	Dana 60	5300	3.54
38	Dana 60	5300	3.73
B4	Dana 60 Limited Slip	5300	4.10
C7	Dana 60 Limited Slip	5300	3.54
C8	Dana 60 Limited Slip	5300	3.73
27	Dana 70	7400	4.10
28	Dana 70	7400	4.56
36	Dana 70	7400	3.73
D7	Dana 70 Limited Slip	7400	4.10

E-100 thru E-350 (Non-Locking)

Code	Description	#Capacity	Ratio
13	Ford	3750	2.75
14	Ford	3750	3.00
15	Ford	3750	3.25
23	Dana	5300	3.31
37	Dana	5300	3.54
38	Dana	5300	3.73
36	Dana	7400	3.73
27	Dana	7400	4.10

E-100 thru E-350 (Locking)

Code	Description	#Capacity	Ratio
H3	Ford	3750	2.75
H4	Ford	3750	3.25
H7	Ford	3750	3.00
C3	Dana	5300	3.31
C7	Dana	5300	3.54
D7	Dana	7400	4.10

F- and B-600

Code	Description	#Capacity	Ratio
41	Rockwell D-140	13000	5.83
42	Rockwell D-140	13000	6.20
44	Rockwell D-140	13000	6.80
61	Rockwell F-106	15000	5.29
63	Rockwell F-106	15000	6.14
65	Rockwell F-106	15000	6.83
67	Rockwell F-106	15000	7.17
F2	Eaton 15201	15000 2-Speed	5.83/8.12
F3	Eaton 15201	15000 2-Speed	6.33/8.81
52	Rockwell H-172	17500	5.83
53	Rockwell H-172	17500	6.17
54	Rockwell H-172	17500	6.83
55	Rockwell H-172	17500	7.17
E1	Eaton 16244	17500 2-Speed	5.57/7.75
E2	Eaton 16244	17500 2-Speed	6.17/8.58
E3	Eaton 16244	17500 2-Speed	6.50/9.04
E4	Eaton 16244	17500 2-Speed	7.17/9.97
N1	Dana 41752	17500 2-Speed	5.57/7.75
N2	Dana 41752	17500 2-Speed	6.17/8.58
N3	Dana 41752	17500 2-Speed	6.50/9.04
N4	Dana 41752	17500 2-Speed	7.17/9.97

700 thru 9000 Series and N-600 — C-600 School Bus

Code	Description	#Capacity	Ratio
43	Rockwell D-140	13000	5.29
42	Rockwell D-140	13000	6.20
44	Rockwell D-140	13000	6.80
61	Rockwell D-106	15000	6.14
62	Rockwell D-106	15000	5.29
63	Rockwell D-106	15000	6.83
64	Rockwell D-106	15000	6.80
65	Rockwell D-106	15000	7.17
66	Rockwell D-106	15000	7.20
F2	Eaton 15201	15000 2-Speed	5.83/8.12
F3	Eaton 15201	15000 2-Speed	6.33/8.81
52	Rockwell H-172	17500	5.83
53	Rockwell H-172	17500	6.17
54	Rockwell H-172	17500	6.83
55	Rockwell H-172	17500	7.17
E1	Eaton 16244	17500 2-Speed	5.57/7.57
E2	Eaton 16244	17500 2-Speed	6.17/8.58
E3	Eaton 16244	17500 2-Speed	6.50/9.04
E5	Eaton 16244	17500 2-Speed	7.17/9.97
N1	Dana 451752	17500 2-Speed	5.57/7.75
N2	Dana 451752	17500 2-Speed	6.17/8.58
N3	Dana 451752	17500 2-Speed	6.50/9.04
EQ	Eaton 17121	18500	5.57
FQ	Eaton 17121	18500	6.14
GQ	Eaton 17121	18500	6.50
HQ	Eaton 17121	18500	7.17
EH	Eaton 17221	18500 2-Speed	5.57/7.60
FH	Eaton 17221	18500 2-Speed	6.14/8.38
GH	Eaton 17221	18500 2-Speed	6.50/8.87
HH	Eaton 17221	18500 2-Speed	7.17/9.77
P1	Dana 65182	18500 2-Speed	5.57/7.60
P2	Dana 65182	18500 2-Speed	6.14/8.38
P3	Dana 65182	18500 2-Speed	6.50/8.86
P4	Dana 65182	18500 2-Speed	7.17/9.77
BK	Eaton 18121	22000	6.57
CK	Eaton 18121	22000	6.17
DK	Eaton 18121	22000	6.50
EK	Eaton 18121	22000	7.17
DB	Eaton 18221	22000 2-Speed	5.57/7.60
EB	Eaton 18221	22000 2-Speed	6.17/8.41
FB	Eaton 18221	22000 2-Speed	6.50/8.87
GB	Eaton 18221	22000 2-Speed	7.17/9.77
GG	Eaton 23121	23000	3.70
AG	Eaton 23121	23000	4.11
BG	Eaton 23121	23000	4.33
HG	Eaton 23121	23000	4.56
CG	Eaton 23121	23000	4.88
DG	Eaton 23121	23000	5.43
EG	Eaton 23121	23000	6.17
FG	Eaton 23121	23000	6.67
GP	Eaton 23221	23000 2-Speed	4.11/5.60
CP	Eaton 23221	23000 2-Speed	5.43/7.39
DP	Eaton 23221	23000 2-Speed	6.17/8.40
EP	Eaton 23221	23000 2-Speed	6.67/9.08
AP	Eaton 23221	23000 2-Speed	4.35/5.90
1A	Rockwell R-170	23000	4.11
2A	Rockwell R-170	23000	4.33
3A	Rockwell R-170	23000	5.29
4A	Rockwell R-170	23000	6.14
5A	Rockwell R-170	23000	6.83
6A	Rockwell R-170	23000	7.40
7A	Rockwell R-170	23000	5.86
8A	Rockwell R-170	23000	3.70
JF	Eaton 34-DSC	34000	4.11
BF	Eaton 34-DSC	34000	4.33
CF	Eaton 34-DSC	34000	4.56

700 thru 900 Series and N-600 — C-600 School Bus (Continued)

Code	Description	#Capacity	Ratio
LF	Eaton 34-DSC	34000	3.70
FF	Eaton 34-DSC	34000	5.57
GF	Eaton 34-DSE	34000	6.14
HF	Eaton 34-DSE	34000	6.50
MF	Eaton 34-DSE	34000	7.17
KF	Eaton 34-DSE	34000	7.60
FN	Eaton 34-DPC	34000	7.60
AM	Eaton 34-DPE	34000	8.38
FW	Eaton 34-DTE	34000	6.14/8.38
GW	Eaton 34-DTE	34000	6.50/8.87
HW	Eaton 34-DTE	34000	7.17/9.77
BC	Rockwell SLHD	34000	3.70
B1	Rockwell SLHD	34000	4.11
B2	Rockwell SLHD	34000	4.44
B6	Rockwell SLHD	34000	5.83
B7	Rockwell SLHD	34000	6.17
B8	Rockwell SLHD	34000	6.83
B9	Rockwell SLHD	34000	7.80
AJ	Eaton 38-DSC	38000	4.56
BJ	Eaton 38-DSC	38000	4.88
CJ	Eaton 38-DSC	38000	5.57
FJ	Eaton 38-DSC	38000	4.11
GJ	Eaton 38-DSC	38000	4.33
HJ	Eaton 38-DSC	38000	5.29
LJ	Eaton 38-DSC	38000	3.70
DJ	Eaton 38-DSE	38000	6.14
EJ	Eaton 38-DSE	38000	6.50
AR	Eaton 38-DPC	38000	5.05
FR	Eaton 38-DPC	38000	7.60
TA	Rockwell SQHP	38000	3.70
TB	Rockwell SQHP	38000	4.11
TC	Rockwell SQHP	38000	4.44
D1	Rockwell SQHD	38000	4.11
D2	Rockwell SQHD	38000	4.44
D3	Rockwell SQHD	38000	4.63
D4	Rockwell SQHD	38000	5.29
D5	Rockwell SQHD	38000	5.83
D6	Rockwell SQHD	38000	6.63
D8	Rockwell SQHD	38000	4.88
D9	Rockwell SQHD	38000	3.70
DA	Rockwell SQHD	38000	6.17
AV	Eaton 42-DPB	44000	7.60
DV	Eaton 42-DPB	44000	5.91
CV	Eaton 42-DPB	44000	5.05
1X	Eaton 44-DP	44000	5.31
2X	Eaton 44-DP	44000	5.90
3X	Eaton 44-DP	44000	7.20
XB	Rockwell SRDD	44000	5.78
6Y	Rockwell SSHD	44000	3.90
1Y	Rockwell SSHD	44000	4.11
2Y	Rockwell SSHD	44000	4.33
5Y	Rockwell SSHD	44000	4.63
8Y	Rockwell SSHD	44000	4.88
4Y	Rockwell SSHD	44000	5.29
7Y	Rockwell SSHD	44000	5.57
XK	Rockwell SUDD	58000 Top Drive	5.96
XS	Rockwell SFDD	65000 Top Drive	5.76
XT	Rockwell SFDD	65000 Top Drive	8.08

FRONT AXLE AND D.S.O. CODES

DISTRICT SALES OFFICE (DSO) CODE

DSO — FSO — PTO (DOMESTIC, FOREIGN AND SPECIAL ORDER)

The D.S.O. space will show a two-digit code number of the district which ordered the unit (see chart below). This code will appear on all units — domestic or export. If unit is built on a D.S.O., E.S.O., P.T.O. (special orders), the complete order number is under the D.S.O. space after the district code.

FRONT AXLE CODES (Not Applicable On E-100 Thru E-350)

Bronco and F-100 Thru F-350

Adjustable Steering Column	Power Steering	Power Steering and Adjustable Steering Col.	Code	Front Axle
E	N	V	5	3850# Front Axle
J	R	Z	9	4500# Front Axle
B	K	S	2	Roll Bar
C	L	T	3	Roll Bar and 3850# Front Axle
D	M	U	4	Roll Bar and 4500# Front Axle

F- and B-600

P/Steering Delete	W/Power Steering	Code	Front Axle
A	J	—	
D	M	4	7,000

700 Thru 9000 Series and N-600 — C-600

Steer Ease	Delete Power or Manual Steering	Front Axle
K	2	5,500#
M	4	7,000#
N	5	9,000#
P	7	12,000#
S	—	16,000#
T	—	18,000#
U	—	20,000#
—	6	4,700#
R	—	15,000#
Q	9	DSO Front Axle

DISTRICT CODES

			Ford of Canada	
			Mercury Regions	Ford Regions
11 Boston	41 Chicago	71 Los Angeles	A1 Central	B1 Central
12 Buffalo	42 Cleveland	72 San Jose	A2 Eastern	B2 Eastern
13 New York	43 Milwaukee	73 Salt Lake City	A3 Atlantic	B3 Atlantic
14 Pittsburgh	45 Lansing	74 Seattle	A4 Midwestern	B4 Midwestern
15 Newark	46 Indianapolis	75 Phoenix	A6 Western	B6 Western
16 Philadelphia	47 Cincinnati	76 Denver	A7 Pacific	B7 Pacific
17 Washington	48 Detroit	83 Government	A8 Great Lakes	B8 Great Lakes
		84 Home Office Reserve	12 Export	12 Export
21 Atlanta	52 Dallas	85 American Red Cross		
22 Charlotte	53 Kansas City	86 Recreation Vehicles		
23 Memphis	54 Omaha	87 Body Company		
24 Jacksonville	55 St. Louis	89 Transportation Services		
25 Richmond	56 Davenport	90's Export		
26 New Orleans	57 Houston	00 Special		
28 Louisville	58 Twin Cities			

CY1702-2F

Pre-Delivery and Non-Emission System Scheduled Maintenance

**PART
50-02**

SUBJECT	PAGE	SUBJECT	PAGE
PRE-DELIVERY		PRE-DELIVERY (Cont'd.)	
Appearance'	50-02-21	Other Underhood Operations	50-02-17
B-Series Only	50-02-22	Road Test	50-02-20
Body — Cab	50-02-18	MAINTENANCE	50-02-25
Chassis	50-02-19	Maintenance Applicable to Bronco, E-100, E-150, E-250 — E-350 and F-100, F-150, F-250 — F-350 Trucks	50-02-27
Emission Compliance Requirements	50-02-5	Maintenance Applicable to Medium Duty and Heavy Duty Trucks Over 8,500 Pounds GVW	50-02-25
Pre-Delivery Service Record		Non-Emission Systems Required Maintenance Charts	50-02-28
49 States Light Truck — Under 11,000 GVW	50-02-2	Non-Scheduled Maintenance	50-02-45
California Light Truck Under 11,000 GVW	50-02-	SPECIFICATIONS	50-02-49
School Bus Chassis 600-700 and 7000 Series	50-02-5		
Trucks (Over 11,000 GVW) Except CL-9000 Series	50-02-4		

PRE-DELIVERY**PRE-DELIVERY SERVICE RECORDS**

1980 49 STATES LIGHT TRUCK (UNDER 11,000 GVW) PRE-DELIVERY SERVICE RECORD
CHECK/INSPECT THE VEHICLE AS SHOWN: PERFORM SPECIFIED ADJUSTMENTS WHEN REQUIRED

EMISSION COMPLIANCE REQUIREMENTS	REFER TO PAGE	CHASSIS (Cont.)	REFER TO PAGE
☐ CHECK ENGINE COOLING SYSTEM — TOP-UP TO SPECIFIED LEVEL.	50-02-5	☐ CHECK EXHAUST SYSTEM, STEERING GEAR AND FLEX COUPLING, STEERING LINKAGE, SUSPENSION AND FLUID LINES FOR DAMAGE OR LOOSE FASTENERS.	50-02-19
☐ CHECK THROTTLE OPERATION AND IDLE RETURN.	50-02-5	☐ REMOVE SPRING INSULATORS — F250/350 4x4 ONLY.	50-02-19
☐ CHECK CHOKE LINKAGE FOR FREEDOM OF MOVEMENT.	50-02-5	☐ TORQUE TRUCK DUAL WHEEL NUTS TO SPECIFICATION.	50-02-19
☐ CHECK EMISSION CONTROL SYSTEM FOR LOOSE, MISSING OR DAMAGED COMPONENTS: ALSO CHECK ELECTRICAL AND VACUUM COMPONENTS FOR PROPER CONNECTIONS.	50-02-6	ROAD TEST	
☐ CHECK AND ADJUST CURB IDLE, FAST IDLE, AND THROTTLE SPEED POSITIONER (TSP) TO SPECIFICATION SHOWN ON THE VEHICLE EMISSION CONTROL INFORMATION DECAL.	50-02-6	☐ CHECK STEERING COLUMN LOCK.	50-02-20
☐ CHECK ENGINE DRIVEABILITY DURING ROAD TEST (INCLUDING FAST IDLE RETURN TO CURB IDLE DURING WARM-UP).	50-02-17	☐ CHECK STARTING OF ENGINE IN PARK AND NEUTRAL.	50-02-20
OTHER UNDERHOOD OPERATIONS		☐ CHECK OPERATION OF HORN, WINDSHIELD WIPER AND WASHER, LIGHTS, SIGNALS AND INSTRUMENTS.	50-02-20
☐ CHECK AND TOP-UP ALL FLUIDS TO SPECIFIED LEVELS — ENGINE OIL, BRAKE MASTER CYLINDER, WINDSHIELD AND REAR WINDOW WASHER RESERVOIRS, AUTOMATIC TRANSMISSION (HOT), POWER STEERING (HOT).	50-02-17	☐ CHECK OPERATION OF HEATER/AIR CONDITIONER/DEFROSTER/VENTILATION SYSTEM, RADIO, SEAT BELT WARNING SYSTEM AND ALL OTHER OPTIONAL EQUIPMENT.	50-02-20
☐ CHECK BATTERY FOR 1.230 SPECIFIC GRAVITY (12.45 OPEN CIRCUIT VOLTAGE ON MAINTENANCE-FREE). RECHARGE IF NECESSARY.	50-02-18	☐ CHECK BRAKES (INCLUDING PARKING BRAKE AND WARNING LIGHT).	50-02-20
BODY		☐ CHECK STEERING CONTROL.	50-02-20
☐ INSTALL LOOSE ITEMS SUCH AS WHEEL COVERS, CIGAR LIGHTER, ANTENNA, LUGGAGE RACK, TRUCK EXTERIOR MIRRORS AND OTHER OPTIONAL EQUIPMENT.	50-02-18	☐ CHECK DRIVEABILITY — SEE EMISSION COMPLIANCE REQUIREMENTS.	50-02-21
☐ CHECK OPERATION OF DOORS, TAILGATE, HOOD AND GLOVE BOX.	50-02-18	☐ CHECK AUTOMATIC TRANSMISSION OR MANUAL TRANSMISSION AND CLUTCH PERFORMANCE.	50-02-17
☐ CHECK OPERATION OF ALL LOCKS AND KEYS.	50-02-18	☐ CHECK FOR SQUEAKS, RATTLES, AND BELT NOISE.	50-02-21
☐ CHECK OPERATION OF WINDOWS AND VENTS.	50-02-19	APPEARANCE	
☐ CHECK OPERATION OF SEATS AND SEATBACK LATCHES.	50-02-19	☐ WASH AND PERFORM DETAILED CLEAN-UP OF INTERIOR AND EXTERIOR.	50-02-21
CHASSIS		☐ CHECK EXTERIOR AND INTERIOR FOR PROPER APPEARANCE AND FIT.	50-02-21
☐ GHECK AND TOP-UP FLUID LEVELS IN MANUAL TRANSMISSION AND AXLE (AND 4x4 TRANSFER CASE).	50-02-19	☐ TOUCH UP MINOR PAINT BLEMISHES (BRUSH, AEROSOL CAN AND/OR SPOT POLISH).	50-02-22
☐ ADJUST TIRE PRESSURES TO SPECIFICATION.	50-02-19	☐ CHECK FOR NECESSARY OWNER INFORMATION MATERIAL IN GLOVE BOX.	50-02-22
		☐ REMOVE SEAT AND CARPET PROTECTIVE COVERS.	50-02-22

CY1550-2J1

1980 CALIFORNIA LIGHT TRUCK (UNDER 11,000 GVW) PRE-DELIVERY SERVICE RECORD
CHECK/INSPECT THE VEHICLE AS SHOWN: PERFORM SPECIFIED ADJUSTMENTS WHEN REQUIRED

EMISSION COMPLIANCE REQUIREMENTS	REFER TO PAGE	CHASSIS	REFER TO PAGE
☐ CHECK ENGINE COOLING SYSTEM — TOP-UP TO SPECIFIED LEVEL.	50-02-5	☐ CHECK AND TOP-UP FLUID LEVELS IN MANUAL TRANSMISSION AND AXLE (AND 4x4 TRANSFER CASE).	50-02-19
☐ CHECK THROTTLE OPERATION AND IDLE RETURN.	50-02-5	☐ REMOVE SPRING INSULATORS — F250/350 4x4 ONLY.	50-02-19
☐ CHECK CHOKE LINKAGE FOR FREEDOM OF MOVEMENT.	50-02-5	☐ ADJUST TIRE PRESSURES TO SPECIFICATION.	50-02-19
☐ CHECK EMISSION CONTROL SYSTEM FOR LOOSE, MISSING OR DAMAGED COMPONENTS: ALSO CHECK ELECTRICAL AND VACUUM COMPONENTS FOR PROPER CONNECTIONS.	50-02-6	☐ CHECK EXHAUST SYSTEM, STEERING GEAR AND FLEX COUPLING, STEERING LINKAGE, SUSPENSION AND FLUID LINES FOR DAMAGE OR LOOSE FASTENERS.	50-02-19
☐ CHECK AND ADJUST CURB IDLE, FAST IDLE, AND THROTTLE SPEED POSITIONER (TSP) TO SPECIFICATION SHOWN ON THE VEHICLE EMISSION CONTROL INFORMATION DECAL.	50-02-6	☐ TORQUE TRUCK DUAL WHEEL NUTS TO SPECIFICATION.	50-02-19
☐ CHECK ENGINE DRIVEABILITY DURING ROAD TEST (INCLUDING FAST IDLE RETURN TO CURB IDLE DURING WARM-UP).	50-02-17		
OTHER UNDERHOOD OPERATIONS		ROAD TEST	
☐ CHECK AND TOP-UP ALL FLUIDS TO SPECIFIED LEVELS — ENGINE OIL, BRAKE MASTER CYLINDER, WINDSHIELD AND REAR WINDOW WASHER RESERVOIRS, AUTOMATIC TRANSMISSION (HOT), POWER STEERING (HOT).	50-02-17	☐ CHECK STEERING COLUMN LOCK.	50-02-20
☐ CHECK BATTERY FOR 1.230 SPECIFIC GRAVITY (12.45 OPEN CIRCUIT VOLTAGE ON MAINTENANCE-FREE). RECHARGE IF NECESSARY.	50-02-18	☐ CHECK STARTING OF ENGINE IN PARK AND NEUTRAL.	50-02-20
BODY		☐ CHECK OPERATION OF HORN, WINDSHIELD WIPER AND WASHER, LIGHTS, SIGNALS AND INSTRUMENTS.	50-02-20
☐ INSTALL LOOSE ITEMS — SUCH AS WHEEL COVERS, CIGAR LIGHTER, ANTENNA, LUGGAGE RACK, TRUCK EXTERIOR MIRRORS AND OTHER OPTIONAL EQUIPMENT.	50-02-18	☐ CHECK OPERATION OF HEATER/AIR CONDITIONER/DEFROSTER/VENTILATION SYSTEM, RADIO, SEAT BELT WARNING SYSTEM AND ALL OTHER OPTIONAL EQUIPMENT.	50-02-20
☐ CHECK OPERATION OF DOORS, TRUNK LID, HOOD AND GLOVE BOX.	50-02-18	☐ CHECK BRAKES (INCLUDING PARKING BRAKE AND WARNING LIGHT).	50-02-20
☐ CHECK OPERATION OF ALL LOCKS AND KEYS.	50-02-18	☐ CHECK STEERING CONTROL.	50-02-21
☐ CHECK OPERATION OF WINDOWS AND VENTS.	50-02-19	☐ CHECK DRIVEABILITY — SEE EMISSION COMPLIANCE REQUIREMENTS.	50-02-17
☐ CHECK OPERATION OF SEATS AND SEATBACK LATCHES.	50-02-19	☐ CHECK AUTOMATIC TRANSMISSION OR MANUAL TRANSMISSION AND CLUTCH PERFORMANCE.	50-02-21
		☐ CHECK FOR SQUEAKS, RATTLES, AND BELT NOISE.	50-02-21
		APPEARANCE	
		☐ WASH AND PERFORM DETAILED CLEAN UP OF INTERIOR AND EXTERIOR.	50-02-21
		☐ CHECK EXTERIOR AND INTERIOR FOR PROPER APPEARANCE AND FIT.	50-02-21
		☐ TOUCH UP MINOR PAINT BLEMISHES (BRUSH, AEROSOL CAN AND/OR SPOT POLISH).	50-02-22
		☐ CHECK FOR NECESSARY OWNER INFORMATION MATERIAL IN GLOVE BOX.	50-02-22
		☐ REMOVE SEAT AND CARPET PROTECTIVE COVERS.	50-02-22

CY1550-2J2

1980 TRUCKS (OVER 11,000 GVW) EXCEPT CL-9000 SERIES — PRE-DELIVERY SERVICE RECORD

CHECK/INSPECT THE VEHICLE AS SHOWN: PERFORM SPECIFIED ADJUSTMENTS WHEN REQUIRED

EMISSION COMPLIANCE REQUIREMENTS	REFER TO PAGE	CHASSIS (Cont.)	REFER TO PAGE
☐ CHECK ENGINE COOLING SYSTEM — TOP-UP TO SPECIFIED LEVEL.	50-02-5	☐ INSPECT ALL FLUID LINES, AIR LINES AND ELECTRICAL HARNESS ROUTINGS AND CONNECTORS. INSPECT FOR LOOSE CONNECTIONS AND LOOSE FASTENERS; FLUID LEAKS AND AUDIBLE AIR LEAKS (AIR BRAKE) INCLUDING AIR SYSTEM LEAK DOWN CHECK. TIGHTEN AS REQUIRED.	50-02-19
☐ CHECK THROTTLE OPERATION AND IDLE RETURN.	50-02-5	☐ INSPECT EXHAUST SYSTEM INCLUDING EXTENSION AND RAIN CAP FOR PROPER INSTALLATION AND DAMAGE. TIGHTEN LOOSE FASTENERS.	50-02-19
☐ CHECK AND ADJUST ENGINE IDLE SPEEDS SPECIFIED ON VEHICLE EMISSION CONTROL INFORMATION DECAL.	50-02-6	☐ TORQUE REAR AXLE SHAFT FLANGE NUTS ON SADDLE MOUNTED DELIVERIES.	50-02-19
☐ CHECK AND ADJUST INITIAL IGNITION TIMING.	50-02-16	☐ CHECK REAR BRAKE ADJUSTMENT ON SADDLE MOUNTED DELIVERIES.	50-02-20
☐ INSPECT ENGINE AIR INTAKE AND BREATHER CAP INSTALLATION FOR ALIGNMENT AND/OR DAMAGE.	50-02-17	☐ CHECK TORQUE ON FRONT AND REAR U-BOLTS.	50-02-20
☐ PERFORM DIESEL ENGINE PRE-DELIVERY OPERATION IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS. (EXCEPT DETROIT DIESEL.)	—	☐ INSPECT PARKING BRAKE CABLE AND LINKAGE FOR PROPER INSTALLATION AND LOOSE FASTENERS.	50-02-20
☐ CHECK ENGINE DRIVEABILITY DURING ROAD TEST (INCLUDING FAST IDLE RETURN TO CURB IDLE DURING WARM-UP).	50-02-17	☐ CHECK AND ADJUST FRONT WHEEL TOE-IN.	50-02-20
OTHER UNDERHOOD OPERATIONS		ROAD TEST	
☐ CHECK AND TOP-UP ALL FLUIDS TO SPECIFIED LEVELS — ENGINE OIL, BRAKE MASTER CYLINDER, CLUTCH MASTER CYLINDER, ENGINE AIR CLEANER OIL RESERVOIR, WINDSHIELD WASHER RESERVOIRS, AUTOMATIC TRANSMISSION, POWER STEERING RESERVOIR (HOT), TILT CAB CYLINDERS.	50-02-17	☐ CHECK OPERATION OF HORN, WINDSHIELD WIPERS AND WASHERS, LIGHT, SIGNALS, AND INSTRUMENTS.	50-02-20
☐ CHECK BATTERY(S) FOR 12.45 OPEN CIRCUIT VOLTAGE. RECHARGE IF NECESSARY.	50-02-18	☐ CHECK OPERATION OF HEATER/AIR CONDITIONER/DEFROSTER/VENT SYSTEM, RADIO, AND ALL OTHER OPERATIONAL EQUIPMENT.	50-02-20
☐ INSPECT COOLING SYSTEM COMPONENTS FOR PROPER INSTALLATION AND FOR LEAKS.	50-02-18	☐ CHECK BRAKES.	50-02-20
CAB		☐ CHECK STEERING CONTROL.	50-02-21
☐ CHECK OPERATION OF WINDOWS AND VENTS. ADJUST AS NECESSARY.	50-02-19	☐ CHECK DRIVEABILITY — SEE EMISSION COMPLIANCE REQUIREMENTS.	50-02-17
☐ CHECK OPERATION OF SEATS.	50-02-19	☐ CHECK MANUAL TRANSMISSION AND CLUTCH PERFORMANCE. ADJUST LINKAGE AS NECESSARY.	50-02-21
☐ CHECK OPERATION OF DOORS, HOOD, AND GLOVE BOX. ADJUST AS NECESSARY.	50-02-18	☐ CHECK OPERATION OF 2-SPEED AXLE.	50-02-21
☐ CHECK OPERATION OF ALL LOCKS AND KEYS.	50-02-18	☐ CHECK FOR SQUEAKS, RATTLES, AND BELT NOISE. TIGHTEN OBVIOUS LOOSE FASTENERS OR BELTS.	50-02-21
☐ INSTALL LOOSE ITEMS — SUCH AS CIGAR LIGHTER(S) AND ANTENNA(S).	50-02-18	APPEARANCE	
CHASSIS		☐ WASH AND PERFORM DETAILED CLEAN-UP OF INTERIOR AND EXTERIOR.	50-02-21
☐ INSPECT TRANSMISSION AND ENGINE MOUNTS FOR PROPER INSTALLATION AND LOOSE FASTENERS.	50-02-19	☐ TOUCH UP MINOR PAINT BLEMISHES (BRUSH, AEROSOL CAN AND/OR SPOT POLISH).	50-02-22
☐ PERFORM AUTOMATIC TRANSMISSION PRE-DELIVERY OPERATION IN ACCORDANCE WITH MANUFACTURER'S INSTRUCTIONS INCLUDING NEUTRAL START SWITCH CHECK.	—	☐ CHECK FOR NECESSARY OWNER INFORMATION MATERIAL IN GLOVE BOX.	50-02-22
☐ ADJUST TIRE PRESSURES TO SPECIFICATION.	50-02-19	☐ REMOVE PROTECTIVE COVERS FROM CAB.	50-02-22
☐ TORQUE WHEEL NUTS TO SPECIFICATION.	50-02-19		
☐ CHECK AND TOP-UP FLUID LEVELS IN MANUAL TRANSMISSION AND AXLE(S).	50-02-19		
☐ CHECK SUSPENSION, STEERING GEAR AND STEERING LINKAGE FOR DAMAGE OR LOOSE FASTENERS. TIGHTEN AS REQUIRED.	50-02-19		

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1980 SCHOOL BUS CHASSIS, 600-700 AND 7000 SERIES, PRE-DELIVERY SERVICE RECORD

CHECK/INSPECT THE VEHICLE AS SHOWN: PERFORM SPECIFIED ADJUSTMENTS WHEN REQUIRED			
EMISSION COMPLIANCE REQUIREMENTS	REFER TO PAGE	ON HOIST OR UNDERSIDE	REFER TO PAGE
☐ CHECK RADIATOR COOLANT LEVEL AND TOP-UP	50-02-5	☐ CHECK MANUAL TRANSMISSION FLUID LEVEL — FILL AS REQUIRED	50-02-19
☐ CHECK CARBURETOR LINKAGE AND CHOKE CONTROL — ADJUST AS REQUIRED	50-02-5	☐ CHECK AXLE AND AXLE SHIFT UNIT LUBE LEVEL — FILL AS REQUIRED	50-02-19
☐ CHECK AND ADJUST DRIVE BELT TENSION	50-02-5	☐ CHECK LINES, FITTINGS, CONNECTIONS AND COMPONENTS ON UNDERSIDE FOR PROPER ASSEMBLY AND LEAKS (INCLUDING AIR BRAKE SYSTEM)	50-02-19
☐ CHECK AND SET INITIAL IGNITION TIMING — USING OSCILLOSCOPE AND/OR METER	50-02-16	☐ CHECK FRONT WHEEL BEARING ADJUSTMENT	50-02-23
☐ CHECK CARBURETOR IDLE SPEED ADJUSTMENTS — ADJUST IF NECESSARY	50-02-6	☐ CHECK STEERING MOUNTING, STOP ADJUSTMENT, LINKAGE AND CONNECTIONS INCLUDING CLEAR VISION	50-02-23
☐ CHECK ENGINE DRIVEABILITY DURING ROAD TEST (INCLUDING FAST IDLE RETURN TO CURB IDLE DURING WARM-UP)	50-02-17	☐ CHECK FRONT AND REAR SPRING U-BOLT TORQUE	50-02-20
UNDERHOOD — ENGINE OFF		☐ DRAIN AIR BRAKE RESERVOIR	50-02-23
☐ CHECK STEERING FLEX COUPLER FOR FLATNESS — CORRECT AS NECESSARY	50-02-22	☐ CHECK EXHAUST SYSTEM FOR ROUTING AND LEAKS	50-02-19
☐ CHECK ENGINE OIL LEVEL — FILL AS REQUIRED	50-02-17	☐ ADJUST REAR BRAKES ON SADDLE MOUNT DELIVERIES	50-02-20
☐ CHECK STEERING GEAR HOUSING LUBRICANT AND FILL AS REQUIRED	50-02-22	☐ LUBE REAR SPRING PINS AND ALL CHASSIS COMPONENTS	50-02-23
☐ CHECK BRAKE MASTER CYLINDER FLUID LEVEL — FILL AS REQUIRED	50-02-17	☐ INSPECT DRIVELINE FOR PROPER ASSEMBLY	50-02-23
☐ CHECK WINDSHIELD WASHER RESERVOIR FLUID LEVEL — FILL AS REQUIRED	50-02-17	☐ CHECK TIRES AND TIRE PRESSURES — ADJUST PRESSURES AS REQUIRED	50-02-19
☐ CHECK BATTERY FLUID LEVEL — FILL AS REQUIRED RECHARGE BATTERY TO 1.230 SPECIFIC GRAVITY	50-02-18	☐ INSPECT FUEL TANK MOUNTING BRACKETS AND STRAPS (50 GALLON AND UP) — TIGHTEN AS REQUIRED	50-02-23
☐ CHECK BATTERY CABLES FOR TIGHTNESS AND PROPER ASSEMBLY — CORRECT AS NECESSARY	50-02-22	ALIGNMENT STALL	
☐ CHECK ELECTRICAL CONNECTIONS AND ROUTING	50-02-22	☐ CHECK FRONT WHEEL TOE-IN AND ADJUST AS REQUIRED	50-02-20
☐ CHECK BRAKE LINES AND HOSES FOR PROPER ASSEMBLY — CORRECT AS REQUIRED	50-02-19	☐ TORQUE WHEEL NUTS	50-02-19
☐ CHECK POWER STEERING LINES FOR PROPER ROUTING AND LEAKS AND CORRECT AS NECESSARY	50-02-19	☐ CHECK AND CORRECT RUNOUT (CAST SPOKE WHEELS)	50-02-23
☐ CHECK OIL BATH AIR CLEANER FLUID LEVEL — FILL AS REQUIRED	50-02-17	ROAD TEST	
UNDERHOOD — ENGINE OPERATING AND HOT		☐ CHECK NEUTRAL START SWITCH OPERATION (AUTOMATIC TRANSMISSION)	50-02-20
☐ CHECK POWER STEERING RESERVOIR FLUID LEVEL AND FILL AS REQUIRED	50-02-18	☐ CHECK PARKING BRAKE OPERATION	50-02-21
☐ CHECK AUTOMATIC TRANSMISSION FLUID LEVEL — FILL AS REQUIRED	50-02-18	☐ CHECK HORN, WINDSHIELD WIPERS AND WASHER OPERATION	50-02-20
☐ CHECK LINES, FITTINGS, CONNECTIONS AND COMPONENTS FOR LEAKS INCLUDING AIR BRAKE SYSTEM	50-02-19	☐ CHECK BRAKE, CLUTCH AND ACCELERATOR PEDAL OPERATION	50-02-21
☐ CHECK COOLING SYSTEM FOR LEAKS	50-02-18	☐ CHECK TRANSMISSION SHIFT OPERATION	50-02-21
ON OUTSIDE		☐ CHECK 2-SPEED AXLE CONTROL OPERATION	50-02-21
☐ CHECK HOOD ALIGNMENT AND LOCK OPERATION	50-02-18	☐ CHECK ENGINE PERFORMANCE — SEE EMISSION COMPLIANCE REQUIREMENTS	50-02-17
☐ INSTALL NEW GASKETS SUPPLIED WITH VEHICLES (SADDLE MOUNTED) AND TORQUE REAR AXLE FLANGE RETAINING NUTS	50-02-19	☐ CHECK STEERING CONTROL	50-02-21
☐ CHECK HEADLIGHT AIM AND ADJUST AS REQUIRED	50-02-22	☐ CHECK SQUEAKS AND RATTLES	50-02-21
☐ TORQUE REAR AXLE SHAFT FLANGE NUTS (ON NON SADDLE MOUNTED UNITS)	50-02-19	☐ CHECK ALL INSTRUMENTS FOR PROPER OPERATION	50-02-20
ON INSIDE		☐ CHECK RADIO OPERATION (IF SO EQUIPPED)	50-02-20
☐ CHECK LOW AIR PRESSURE OR VACUUM BUZZER GAUGE AND OPERATION	50-02-22	AFTER ROAD TEST	
☐ CHECK AND ADJUST CLUTCH PEDAL FREE PLAY AND TOTAL TRAVEL	50-02-21	☐ CHECK FOR FLUID LEAKS — CORRECT AS NECESSARY	50-02-21
☐ CHECK OPERATION OF ALL LIGHTS, TURN SIGNALS, HAZARD WARNING FLASHERS AND GAUGES	50-02-20	☐ INSPECT FOR INTERIOR AND EXTERIOR METAL AND PAINT DAMAGE AND TOUCH-UP AS REQUIRED (CHASSIS ONLY)	50-02-22
☐ PERFORM AIR SYSTEM LEAKDOWN CHECK	50-02-22	☐ CHECK GLOVE COMPARTMENT FOR WARRANTY FACTS BOOKLET, OWNER CARD AND OWNER PUBLICATIONS	50-02-22

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EMISSION COMPLIANCE REQUIREMENTS

CHECK RADIATOR COOLANT LEVEL

With the engine cold (at ambient temperature), check crossflow radiators (horizontal tubes) to see that coolant level is 2 1/2 to 4 inches (0 to 1.5 inches for Bronco, E100-E350 and F100-F350) below the pressure cap seat in the radiator filler neck. Downflow radiators (vertical tubes) should be maintained at 3/4 to 1 1/2 inches below the pressure cap seat in the radiator filler neck.

On cooling systems equipped with a coolant recovery system, it is not necessary to have coolant in the overflow reservoir.

On L-Series gasoline and Ford V-8 Diesel engines, with crossflow radiators, fill until the coolant is visible through the sightglass (engine cold).

CAUTION: Do not operate engine if coolant level is below sightglass.

On L-Series Cummins and Detroit Diesel engines, fill until the coolant is visible through the sightglass.

CHECK THROTTLE OPERATION AND IDLE RETURN

Inspect the throttle linkage for proper installation. Remove the air cleaner, and with the accelerator fully depressed, observe the position of the carburetor throttle plate(s). They should be vertical (wide open position).

Check accelerator for sticking or binding, full return and sufficient height to fully open throttle.

CHECK CHOKE LINKAGE FOR FREEDOM OF MOVEMENT

Physically check all choke linkages for freedom of operation.

CHECK EMISSION CONTROL SYSTEM FOR LOOSE, MISSING OR DAMAGED COMPONENTS. ALSO CHECK ELECTRICAL AND VACUUM COMPONENTS FOR PROPER CONNECTIONS

Visually check vacuum and electrical connections to insure system integrity.

D-2: ENGINE IDLE SPEEDS

CHECK AND ADJUST ENGINE IDLE SPEEDS (INCLUDES DECEL THROTTLE CONTROL SPEEDS WHEN APPLICABLE)

I. Application: Some Models Under 8500 GVW

NOTE: To minimize complaints of excessive high idle speed, after engine "break in", idle speed reduction values for "green" engines have been established on some engines. A "green" engine is an engine which has been operated for less than 100 miles (160 km). The "green" engine idle speed adjustment is the final engine adjustment made during pre-delivery. Idle mixture and timing adjustments are made with the idle speed set to "normal" specifications—then the "green" engine idle speed is set. The "normal" and "under 100 miles" (160 km) specifications are shown in the Vehicle Emission Control Information (VECI) Decal. Note that when an "Idle Speed Reduction" rpm is shown on the VECI Decal, it is subtracted from the "normal" specification to obtain the "green" engine idle speed. The idle rpm tolerances shown on the VECI decal do not apply to "green" engines.

4.9L (300 CID) WITH CARTER YFA-1V (TRUCKS UNDER 8500 GVW)

I. Pre-Adjustment Instruction (All Engine Speeds)

NOTE: Vehicles equipped with speed control—In the event specified engine idle speed cannot be achieved by normal adjustments, disconnect the accelerator cable at the carburetor throttle lever. If specified engine idle speed can be achieved with the accelerator cable disconnected, check speed control installation per procedure outlined in appropriate vehicle shop manual Part before reinstalling accelerator cable. If engine idle speed cannot be adjusted, perform Routine 108—Engine Idle Speed Varies in Part 29-02 of the Engine Manual.

- A. Apply the parking brake and block the wheels.
- B. Turn off all accessories.
- C. Remove the air cleaner assembly and plug the vacuum line(s) to the air cleaner.
- D. Revise the dump valve lines as follows:
 1. For dump valves with one or two vacuum lines at the **side** disconnect and plug the line(s).
 2. For dump valves with one vacuum line at the **top** only, check the line to see it is connected to the intake manifold. If not, remove the line at the dump valve and plug it. Connect a slave line from the dump valve vacuum fitting to an intake manifold vacuum fitting.

- E. Check throttle and choke linkages for freedom of movement. Correct as required.
- F. Connect a Rotunda Tachometer No. 20362 or equivalent.

II. Fast Idle Speed

- A. Remove the spark delay valve, if so equipped, from the distributor vacuum advance line, and route the vacuum line directly to the advance side of the distributor.
- B. Trace the EGR signal vacuum line from the EGR valve to the carburetor:

NOTE: If an EGR-PVS valve or temperature vacuum switch is located in the vacuum line routing disconnect the EGR vacuum line at the EGR valve and plug the line.
- C. Trace spark advance signal line from distributor to carburetor, if a spark/PVS valve or TVS is located in the vacuum line routing, disconnect the distributor vacuum line at the distributor and plug the line.
- D. If not equipped with an EGR/PVS, Spark/PVS valve or temperature vacuum switch **do not detach** the EGR vacuum line or spark line.
- E. Disconnect the fuel evaporative purge valve signal vacuum line as follows. Trace the purge valve vacuum line from the purge valve (located on the canister) to the first point where the vacuum line can be detached from the underhood hose routing, e.g.: vacuum "tee" connection, etc. Disconnect the vacuum line at that point, cap the open port, and plug the vacuum line.

CAUTION: To prevent damage to the purge valve, do not disconnect the vacuum line at the purge valve.

- F. With the engine running at normal operating temperature, the choke plate fully opened, and the transmission in Neutral (M/T) or Park (A/T), place the fast idle lever on the specified step of the fast idle cam. Allow engine speed to stabilize and measure the fast idle rpm. Adjust the fast idle speed if not to specification. (Refer to the Vehicle Emission Control Information Decal for the specified cam step and idle speed).
- G. Run engine at approximately 2500 rpm for 15 seconds and recheck fast idle speed.
- H. Repeat Steps F and G until the fast idle speed can be repeated.
 - I. Reconnect the vacuum line(s)/spark delay valve (if so equipped) removed in Steps A through C.

III. Curb Idle Speed

- A. Run engine at approximately 2500 rpm for 15 seconds.
- B. Allow engine to return to curb idle and place transmission selector in Drive (A/T) or Neutral (M/T).

- C. Allow engine to stabilize at curb idle speed.
- D. Measure curb idle speed and adjust if not within specification. (Refer to the Vehicle Emission Control Information Decal for the specified idle speed).
- E. Curb idle speed is set by adjusting engine idle control hardware located on throttle lever side of the carburetor.
 - 1. If no hardware is present, set the speed by curb idle adjusting screw.
 - 2. If at throttle solenoid positioner is present, set the curb idle speed by rotating the hexagon nut on the end of the solenoid plunger.
 - 3. If a solenoid dashpot (solopot) is present, set the curb idle speed by rotating the dashpot assembly.
- F. Repeat Steps A thru E until the curb idle speed can be repeated.

IV. TSP OFF Speed (Anti-Dieseling Solenoid; includes Solenoid-Dashpot Assembly, if so equipped)

- A. Collapse the plunger by forcing the throttle lever against the plunger, stopping on the curb idle adjusting screw.
- B. Check the TSP OFF speed and adjust if not to specification. (Refer to the Vehicle Emission Control Information Decal for the specified speed).

V. Post-Adjustment Instructions (All Engine Speeds)

- A. Correct the dump valve vacuum line routing (see Step D, Section I in the Pre-Adjustment Instructions).
- B. Reinstall air cleaner assembly and reconnect vacuum line(s).
- C. Run engine at approximately 2500 rpm for 15 seconds and recheck curb idle speed. Adjust if not to specification. (Refer to the Vehicle Emission Control Information Decal).

NOTE: Final curb idle speed measurement must be taken with the air cleaner assembly installed.

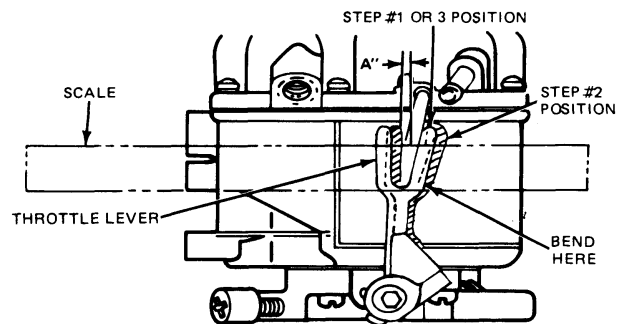
NOTE: If a final curb idle speed adjustment is required on engines equipped with a dash pot, the dash pot clearance must be checked and adjusted to the specified clearance as listed in the Truck Performance Specification Book.

NOTE: If a final curb idle speed adjustment is required the bowl vent setting must be checked as follows (see Fig. 1).

- 1. Stop the engine and turn the ignition key to the "ON" position so that the solenoid is activated but the engine is not running (where applicable). Secure the choke plate in the wide-open position.
- 2. Open the throttle so that the throttle vent lever does not touch the fuel bowl vent rod (see Fig. 1).
- 3. Close the throttle and measure the travel of the fuel bowl vent rod at point "A" from the open throttle position (Step 2 as designated on Figure 1). Travel of the fuel bowl vent rod at

point "A" should be within specification as listed in the Truck Performance Specification Book.

- 4. If out of specification, bend the throttle vent lever at point indicated in the figure, to obtain the required travel.
- 5. Remove all test equipment and torque the air cleaner hold down bolt to specification.



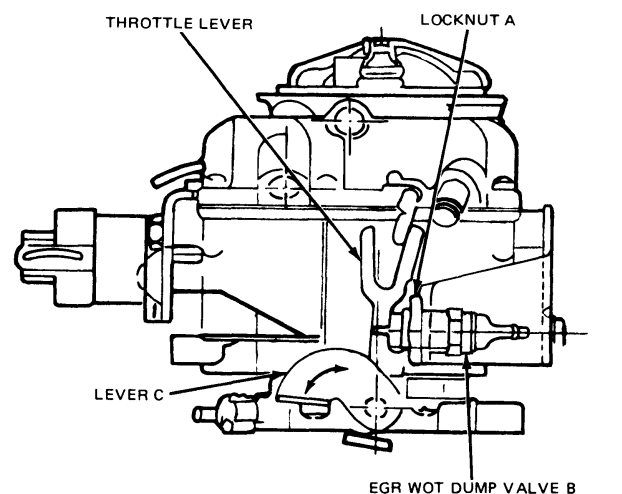
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FIG. 1 YFA Carburetor—Bowl Vent Setting

D. EGR WOT Dump Valve Adjustment

NOTE: The following procedure applies to carburetors equipped with EGR WOT dump valve. Check and adjust as follows: (see Fig. 2).

- 1. Loosen Lock Nut "A".
- 2. Rotate EGR WOT Dump Valve "B" to an outward position.
- 3. Rotate throttle lever to the wide-open position.
- 4. Move the EGR WOT Dump Valve "B" inward until it touches lever "C".
- 5. With Lever "C" returned to its idle position, rotate EGR WOT Dump Valve "B" two turns inward.
- 6. Tighten lock nut "A".



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FIG. 2 YFA Carburetor—EGR WOT Dump Valve Adjustment

**4.9L (300 CID) WITH CARTER YFA AUTO.
(TRUCKS OVER 8500 GVW) (INCLUDES DECEL
THROTTLE CONTROL SPEEDS WHEN
APPLICABLE)**

I. Pre-Adjustment Instructions

- A. Apply parking brake and block the wheels.
- B. Turn off all accessories. Disengage all power take-off units, if so equipped.
- C. With transmission in Neutral (M/T) or Park (A/T), start the engine. Run the engine until normal operating temperature is reached, and then, stop the engine.
- D. Remove the air cleaner assembly and plug the vacuum hose(s) to the assembly.
- E. Check throttle and choke linkages for freedom of movement. Correct as required.
- F. Disconnect system vacuum hose to the decel throttle control diaphragm and plug the hose.
- G. If so equipped, disconnect the fuel evaporative purge valve signal vacuum line as follows: Trace the purge valve vacuum line from the purge valve (located on the canister), to the first point where the vacuum line can be detached from the underhood hose routing, e.g.: vacuum "tee" connection, etc. Disconnect the vacuum line at that point, cap the open port, and plug the vacuum line.

CAUTION: To prevent damage to the purge valve, do not disconnect the vacuum line at the purge valve.

- H. Connect the tachometer.

II. Fast Idle Speed

- A. If the engine is equipped with a retard delay valve, remove the delay valve and install a bypass hose between the remaining vacuum hose ends.
- B. Disconnect the EGR vacuum hose at the EGR valve and plug the hose.
- C. With the engine at normal operating temperature and choke plate fully open, check fast idle speed as follows:

NOTE: Before each speed check, run engine at approximately 2500 rpm for 15 seconds in Neutral/Park.

1. Carburetors Equipped with Automatic Choke
 - a. Depress the throttle lever and manually rotate the fast idle cam until the fast idle adjusting screw rests on the 2nd. step of the cam.
 - b. Check fast idle speed and compare to specification as listed on the Vehicle Emission Control Information Decal. If necessary, adjust the fast idle speed adjusting screw.
 - c. Repeat Steps a and b until specified fast idle speed can be repeated.
- D. Reconnect the EGR vacuum hose at the EGR valve.
- E. If the spark delay valve was removed, detach the by-pass hose and reinstall the delay valve. Make sure the white side of the delay valve faces the distributor advance unit.

III. Curb Idle and Decel Throttle Control Speeds

- A. Check the curb idle speed as follows:

1. For carburetors equipped with a TSP device or a solenoid-dashpot, verify that the solenoid is energized. Correct as required.
2. Run the engine at approximately 2500 rpm for 15 seconds and then allow engine to return to curb idle.
3. Allow the engine speed to stabilize and compare curb idle engine speed to specification as listed on the Vehicle Emission Control Information Decal. If the engine speed is not within specification, adjust the curb idle speed as follows:

- a. On carburetors equipped with TSP, loosen the solenoid body locknut, then rotate the solenoid body until the specified curb idle speed is obtained. Tighten the solenoid locknut to lock the solenoid in place on the mounting bracket.

NOTE: If necessary, temporarily disconnect the solenoid wire (to prevent twisting) when rotating the solenoid body.

- b. On carburetors with no solenoid device, rotate the throttle adjusting screw until the specified curb idle speed as listed on the Vehicle Emission Control Information Decal, is obtained.

NOTE: Check dashpot clearance, if equipped, each time the curb idle speed is adjusted. Collapse the dashpot stem and check the clearance between the collapsed stem and the throttle lever pad. Adjust if not to specification. (Refer to the Truck Performance Specifications Book).

4. Repeat Steps 2 and 3 until the specified curb idle speed is repeatable.
- B. On engines equipped with separate decel throttle control diaphragm and TSP, check the decel throttle control engine speed as follows:
 1. Make sure the curb idle speed is adjusted to specification as listed on the Vehicle Emission Control Information Decal in accordance with Step A.
 2. Connect a slave vacuum hose from an engine manifold vacuum source to the diaphragm.
 3. With the transmission selector in Neutral/Park, run the engine at approximately 2500 rpm for 15 seconds. Then, release the throttle.
 4. Allow one (1) minute for the engine speed to stabilize, then compare the engine speed to specification. If the engine speed is not within specification, adjust the diaphragm shaft length by loosening the lock nut, if so equipped (see note below) on the adjusting screw. Rotate the screw until the specified engine speed is obtained. Retighten the lock nut (if so equipped).

NOTE: Avoid damage to the vacuum diaphragm by holding the diaphragm shaft with a 1/4" open-end wrench. Using a second 1/4" open-end wrench, turn the adjusting screw in or out.

5. Allow the engine to return to curb idle speed by disconnecting the slave manifold vacuum hose from the diaphragm and plugging the hose.
6. Repeat Steps 1 thru 4 until the specified engine speeds are repeatable.
- C. Check the dash pot clearance, if so equipped. Collapse the dash pot stem and check the clearance between the collapsed dash pot stem and the throttle lever pad. Adjust if not to specification. (Refer to the Truck Performance Specifications Book).

IV. TSP OFF Idle Speed

- A. With the engine idling and the transmission selector in Neutral/Park, collapse the solenoid plunger by forcing the throttle lever pad against the plunger.
- B. Measure the TSP OFF idle speed and compare to specification. (Refer to the Vehicle Emission Control Information Decal). If the engine speed is not within specification, adjust the throttle adjusting screw until the specified engine speed is obtained.

V. Post Adjustment Instructions

- A. Remove the slave manifold vacuum hose from the engine and reconnect the decel throttle control vacuum hose to the diaphragm.
- B. Reinstall the air cleaner assembly and reconnect vacuum hose(s).
- C. Recheck curb idle speed. Adjust if not to specification as shown on the Vehicle Emission Control Information Decal.

NOTE: Final curb idle speed must be taken with the air cleaner assembly installed.

- D. Stop the engine. Remove all test equipment and tighten the air cleaner wing nut(s) to specification.
- E. If the carburetor is equipped with a mechanical bowl vent and a final curb idle speed adjustment was required, the bowl vent setting must be checked as follows (see Fig. 1).
 1. Stop the engine and turn the ignition key to the "ON" position so that the solenoid is activated but the engine is not running (where applicable). Secure the choke plate in the wide-open position.
 2. Open the throttle so that the throttle vent lever does not touch the fuel bowl vent rod (see Fig. 1).
 3. Close the throttle and measure the travel of the fuel bowl vent rod at point "A" from the open throttle position (Step 2 as designated on figure shown on previous page). Travel of the fuel bowl vent rod at point "A" should be within specification. (Refer to the Truck Performance Specification Book.)
 4. If out of specification, bend the throttle vent lever at point indicated in the figure, to obtain the required travel.
 5. Remove all test equipment and torque the air cleaner wing nut to specification.

- F. The following procedure applies to engines equipped with EGR WOT dump valves. Check and adjust as follows: (See Fig. 2.)

1. Loosen Lock Nut A.
Rotate EGR WOT dump valve B to an outward position.
3. Rotate throttle lever to the wide-open position.
4. Move the EGR WOT dump valve B inward until it just touches lever C.
5. With Lever C returned to its idle position, rotate EGR WOT dump valve B two turns inward.
6. Tighten lock nut A.

5.0L (302) AND 5.8L (351W CID) WITH 2150-2V (TRUCKS UNDER 8500 GVW)

I. Pre-Adjustment Instruction (All Engine Speeds)

- A. Apply the parking brake and block the wheels.
- B. Turn off all accessories.
- C. Remove the air cleaner assembly and plug the vacuum line(s) to the air cleaner.
- D. Revise the dump valve lines as follows:
 1. For dump valves with one or two vacuum lines at the side disconnect and plug the line(s).
 2. For dump valves with one vacuum line at the top only, check the line to see it is connected to the intake manifold. If not, remove the line at the dump valve and plug it. Connect a slave line from the dump valve vacuum fitting to an intake manifold vacuum fitting.
- E. Check throttle and choke linkages for freedom of movement. Correct as required.
- F. Connect a Rotunda Tachometer No. 20362 or equivalent.

NOTE: Vehicles equipped with speed control—In the event specified engine idle speed cannot be achieved by normal adjustments, disconnect the accelerator cable at the carburetor throttle lever. If specified engine idle speed can be achieved with the accelerator cable disconnected, check speed control installation per procedure outlined in appropriate vehicle shop manual before reinstalling accelerator cable. If engine idle speed cannot be adjusted, perform Routine 108—Engine Idle Speed Varies.

II. Fast Idle Speed

- A.1. Vehicles equipped with 5.0L (302 CID engine), remove the spark delay valve, if so equipped, from the distributor vacuum advance line, and route the vacuum line directly to the advance side of the distributor.
If a PVS lock out is used in the distributor vacuum advance hose, remove the vacuum hose at the distributor and plug.
2. Vehicles equipped with 5.8L (351W CID) engine, do not remove vacuum hose from distributor.
- B. Trace the EGR signal vacuum line from the EGR valve to the carburetor:
 1. If an EGR/PVS valve or temperature vacuum switch is located in the vacuum line routing

disconnect the EGR vacuum line at the EGR valve and plug the line.

2. If not equipped with an EGR/PVS valve or temperature vacuum switch **do not detach** the EGR vacuum line.
- C. Disconnect the fuel evaporative purge valve signal vacuum line as follows: Trace the purge valve vacuum line to the remote purge valve. Disconnect the vacuum line at that point, and plug the vacuum line.
- D. If the vehicle is equipped with a continuous purge system thru the PCV leave the system in place.
- E. With the engine running at normal operating temperature, the choke plate fully opened, and the transmission in Neutral (M/T) or Park (A/T), place the fast idle lever on the specified step of the fast idle cam. (Refer to the Vehicle Emission Control Information Decal). Allow engine speed to stabilize and measure the fast idle rpm. Adjust the fast idle speed if not to specification. (Refer to the Vehicle Emission Control Information Decal for specified idle speed).
- F. Run engine at approximately 2500 rpm for 15 seconds and recheck fast idle speed.
- G. Repeat Steps D and E until the fast idle speed can be repeated.
- H. Reconnect the vacuum line(s) spark delay valve (if so equipped) removed in Steps A thru C.

III. Curb Idle Speed

- A. Run engine at approximately 2500 rpm for 15 seconds.
- B. Allow engine to return to curb idle and place transmission selector in Drive (A/T) or Neutral (M/T).
- C. Allow engine to stabilize at curb idle speed.
- D. Measure curb idle speed and adjust if not to specification. (Refer to the Vehicle Emission Control Information Decal specified idle speed).
NOTE: If the curb idle speed cannot be adjusted low enough check for the presence of a dash pot. If so equipped, adjust the dash pot until there is clearance between the dashpot stem and the throttle lever pad.
- E. Repeat Steps A through D until the curb idle speed can be repeated.
- F. Check dash pot clearance, if so equipped. Collapse the dash pot stem and check the clearance between the collapsed dash pot stem and throttle lever pad. Adjust if not to specification as listed in the Truck Performance Specifications Book.

IV. TSP OFF Speed (Anti-Dieseling Solenoid; includes Solenoid-Dash Pot Assembly, if so equipped)

- A. Collapse the plunger by forcing the throttle lever against the plunger.
- B. Check the TSP OFF speed and adjust if not to the specification listed on the Vehicle Emission Control Information Decal.

V. Post-Adjustment Instructions (All Engine Speeds)

- A. Correct the dump valve vacuum line routing (see Step D, Section I in the Pre-Adjustment Instructions).

- B. Reinstall air cleaner assembly and reconnect vacuum line(s).
- C. Run engine at approximately 2500 rpm for 15 seconds and recheck curb idle speed. Adjust if not to specification.

NOTE:

a. Final curb idle speed measurement must be taken with the air cleaner assembly installed.

b. If a final curb idle speed adjustment is required on engines equipped with a dash pot, the dash pot clearance must be checked and adjusted to the specified clearance. (See Step F of Section III).

5.8L (351M CID) AND 6.6L (400 CID) WITH 2150-2V (TRUCKS UNDER 8500 GVW)

I. Pre-Adjustment Instruction (All Engine Speeds)

- A. Apply the parking brake and block the wheels.
- B. Turn off all accessories.
- C. Remove the air cleaner assembly and plug the vacuum line(s) to the air cleaner.
- D. Revise the dump valve lines as follows:
 1. For dump valves with one or two vacuum lines at the **side** disconnect and plug the line(s).
 2. For dump valves with one vacuum line at the top only, check the line to see it is connected to the intake manifold. If not, remove the line at the dump valve and plug it. Connect a slave line from the dump valve vacuum fitting to an intake manifold vacuum fitting.
- E. Check throttle and choke linkages for freedom of movement. Correct as required.
- F. Connect a Rotunda Tachometer No. 20362 or equivalent.

NOTE: Vehicles equipped with speed control—In the event specified engine idle speed cannot be achieved by normal adjustments, disconnect the accelerator cable at the carburetor throttle lever. If specified engine idle speed can be achieved with the accelerator cable disconnected, check speed control installation per procedure outlined in appropriate vehicle shop manual before reinstalling accelerator cable. If engine idle speed cannot be adjusted, perform Routine 108—Engine Idle Speed Varies.

II. Fast Idle Speed

- A. Remove the spark delay valve, if so equipped, from the distributor vacuum advance line, and route the vacuum line directly to the advance side of the distributor.
- B. Trace the EGR signal vacuum line from the EGR valve to the carburetor:
 1. If an EGR/PVS valve or temperature vacuum switch is located in the vacuum line routing, disconnect the EGR vacuum line at the EGR valve and plug the line.
 2. If not equipped with an EGR/PVS valve or temperature vacuum switch, **do not detach** the EGR vacuum line.

- C. Disconnect the fuel evaporative purge valve signal vacuum line as follows: Trace the purge valve vacuum line from the purge valve (located on the canister) to the first point where the vacuum line can be detached from the underhood hose routing, e.g.: vacuum "tee" connection, etc. Disconnect the vacuum line at that point, cap the open port, and plug the vacuum line.
 - D. If equipped with a continuous purge system through the PCV, leave the system in place.
 - E. With the engine running at normal operating temperature, the choke plate fully opened, and the transmission in Neutral (M/T) or Park (A/T), place the fast idle lever on the specified step of the fast idle rpm. Allow engine speed to stabilize and measure the fast idle rpm. Adjust the fast idle speed if not to specification. (Refer to the Vehicle Emission Control Information Decal for specified cam step and idle speed).
 - F. Run engine at approximately 2500 rpm for 15 seconds and recheck fast idle speed.
 - G. Repeat Steps D and E until the fast idle speed can be repeated.
 - H. Reconnect the vacuum line(s)/spark delay valve (if so equipped) removed in Steps A thru C.
- III. Pre-Curb Idle rpm Check or Adjustment**
- A. Run engine at approximately 2500 rpm for 15 seconds.
 - B. Allow engine to return to curb idle and place transmission selector in Drive (A/T) or Neutral (M/T).
 - C. Allow engine to stabilize at curb idle rpm.
 - D. Measure Curb Idle Speed and Adjust if not to specification. (Refer to the Vehicle Emission Control Information Decal for specified cam step, and idle speed).
- IV. Curb Idle—Manual Transmission A/C and Non-A/C, Automatic Transmission Non-A/C (Carburetor Equipped with Dash Pot)**
- A. Adjust curb idle RPM by turning the throttle stop adjusting screw until the specified RPM is obtained. Refer to the Vehicle Emission Control Information Decal for specified idle speed.
NOTE: If the curb idle RPM cannot be adjusted low enough, check the specified clearance between the dash pot stem and throttle lever.
 - B. Repeat Steps A thru D of Section III until curb idle RPM can be repeated.
 - C. Check dash pot clearance between the dash pot stem and the throttle lever; adjust if not to specification as listed in the Truck Performance Specification Book.
- V. Curb Idle—Automatic Transmission with A/C (Carburetor Equipped with Solenoid Dash Pot)**
- A. A/C OFF—Verify that the throttle stop adjusting screw is not engaging the throttle lever pad and that the dash pot is completely collapsed. Adjust curb idle RPM by turning the long screw (part of the solenoid dash pot bracket) until specified A/C OFF RPM is obtained. Refer to the Vehicle Emission Control Information Decal for specified idle speed.
 - B. Repeat Steps A thru D of Section III until curb idle A/C OFF RPM can be repeated.
 - C. A/C ON (Solenoid Dash Pot Energized)
 1. Shut the engine off, then turn the ignition switch to the "Engine Run" position—DO NOT START.
 2. Move the climate control selector to the A/C ON position.
 3. Manually move the throttle lever away from the energized solenoid dash pot and observe that a new throttle stop position is obtained.
 4. If the solenoid dash pot does not extend, verify the A/C selector position and solenoid dash pot connection. Repair or replace as required.
NOTE: There is no curb idle A/C ON specification.
- VI. Post-Adjustment Instructions (All Engine Speeds)**
- A. Correct the dump valve vacuum line routing (see Step D, Section I in the Pre-Adjustment Instructions).
 - B. Re-install the air cleaner assembly and re-connect the pertinent vacuum line(s).
 - C. Run the engine at approximately 2500 RPM for 15 Seconds and re-check the curb idle speed. Adjust if not to specification.
- 5.8L (351M CID) AND 6.6L (400 CID) WITH 2150-2V (TRUCKS OVER 8500 GVW)**
- I. Pre-Adjustment Instruction (All Engine Speeds)**
- A. Apply the parking brake and block the wheels.
 - B. Turn off all accessories. Disengage all Power Take-Off units, if so equipped.
 - C. With transmission in Neutral (M/T) or Park (A/T), start the engine. Run the engine until normal operating temperature is reached, and then, stop the engine.
 - D. Remove the air cleaner assembly and plug the vacuum line(s) to the air cleaner.
 - E. Check throttle and choke linkages for freedom of movement. Correct as required.
 - F. Disconnect system vacuum hose to the decel throttle control diaphragm and plug the hose.
 - G. If so equipped, disconnect the fuel evaporative purge valve signal vacuum line as follows: Trace the purge valve vacuum line from the purge valve (located on the canister), to the first point where the vacuum line can be detached from the underhood hose routing, e.g.: vacuum "tee" connection, etc. Disconnect the vacuum line at **that point**, cap the open port, and plug the vacuum line.
CAUTION: To prevent damage to the purge valve, do not disconnect the vacuum line at the purge valve.
 - H. If equipped with a continuous purge system through the PCV, leave the system in place.
 - I. Connect a Rotunda Tachometer No. 20362 or equivalent.
- II. Fast Idle Speed**
- A. If the distributor vacuum line is equipped with a retard delay valve, remove the delay valve and

install a jumper vacuum hose between the remaining vacuum hose ends.

- B. Disconnect the EGR vacuum hose at the EGR valve and plug the hose.
- C. With the engine at normal operating temperature and choke plate fully open, check fast idle speed as follows:

NOTE: Before each speed check, run engine at approximately 2500 RPM for 15 Seconds in Neutral/Park.

1. Depress the throttle lever and manually rotate the fast idle cam until the fast idle adjusting screw rests on the specified step of the cam.
2. Check fast idle speed and compare to specification. (Refer to the Vehicle Emission Control Information Decal for specified cam step and idle speed.) If necessary, adjust the fast idle speed adjusting screw.
3. Repeat Steps # 1 and 2 until specified fast idle speed can be repeated.
- D. If the retard delay valve was removed, detach the jumper vacuum hose and re-install the delay valve, making sure the **white** side of the delay valve faces the distributor advance unit.
- E. Reconnect the EGR Vacuum hose at the EGR valve.

III. Curb Idle and Decel Throttle Control Speeds

NOTE: Steps # A and C of the following procedure are applicable only to engines having decel throttle control mechanism.

- A. On engines equipped with **integral** decel throttle control diaphragm and TSP, check the decel throttle control engine speed as follows:
 1. Verify that the throttle solenoid is energized. Correct as required.
 2. Connect a slave vacuum hose from an engine manifold vacuum source to the diaphragm.
 3. Run the engine at approximately 2500 rpm for 15 seconds; then release the throttle.
 4. Allow one (1) minute for the engine speed to stabilize, then compare engine speed to the specification listed on the Vehicle Emission Control Information Decal. If the engine speed is not to specification, adjust the solenoid positioner by rotating the long screw (part of the mounting bracket) until the specified engine speed is obtained.
 5. Allow engine to return to curb idle speed by disconnecting the slave manifold vacuum hose from the diaphragm and plugging the hose.
- B. Check the curb idle speed as follows:
 1. For carburetors equipped with a TSP device or a solenoid-dashpot, verify that the solenoid is energized. Correct as required.
 2. Run the engine at approximately 2500 rpm for 15 seconds and then allow engine to return to curb idle.
 3. Allow the engine speed to stabilize and compare curb idle engine speed to specification as listed on the Vehicle Emission Control Information Decal. If the engine speed is not within specification, adjust the curb idle speed as follows:

- a. On carburetors equipped with a separate TSP, adjust the solenoid positioner by rotating the long screw (part of the mounting bracket) until the specified curb idle speed is obtained.
- b. On carburetors equipped with the integral decel throttle control diaphragm and TSP or equipped with a solenoid-dashpot, rotate the hex head on the rear of the solenoid until the specified curb idle speed is obtained.
- c. On carburetors with no solenoid device, rotate the throttle adjusting screw until the specified curb idle speed is obtained.

NOTE: Check dashpot clearance, if equipped, each time the curb idle speed is adjusted. Collapse the dashpot stem and check the clearance between the collapsed stem and the throttle lever pad. Adjust if not to specification. (Refer to the Truck Performance Specifications Book).

4. Repeat Steps 2 and 3 until the specified curb idle speed is repeatable.
- C. On engines equipped with integral decel throttle control diaphragm and TSP, repeat Steps 3, a and b until both specified engine speeds are repeatable.
- D. Check dashpot clearance, if so equipped. Collapse the dashpot stem and check the clearance between the collapsed dashpot stem and the throttle lever pad. Adjust if not to specification.

IV. TSP-Off Idle Speed

- A. With the engine idling and the transmission selector in Neutral/Park, collapse the solenoid plunger by forcing the throttle lever pad against the plunger.
- B. Measure the TSP-OFF idle speed and compare to specification. (Refer to the Vehicle Emission Control Information Decal). If the engine speed is not within specification, adjust the throttle adjusting screw until the specified engine speed is obtained.

V. Post Adjustment Instructions

- A. Remove the slave manifold vacuum hose from the engine and reconnect the decel throttle control vacuum hose to the diaphragm.
 - B. Reinstall the air cleaner assembly and reconnect vacuum hose(s).
 - C. Recheck curb idle speed. Adjust if not to specification.
- NOTE: Final curb idle speed must be taken with the air cleaner assembly installed.**
- D. Stop the engine. Remove all test equipment and tighten the air cleaner wing nut(s) to specification.

6.1L (370 CID) WITH HOLLEY 2300 EG-2V, 6.1L (370 CID) AND 7.0L (429 CID) WITH HOLLEY 4180 EG-4V (TRUCKS OVER 8500 GVW) (INCLUDES DECEL THROTTLE CONTROL SPEEDS WHEN APPLICABLE)

I. Pre-Adjustment Instructions

- A. Apply parking brake and block the wheels.

- B. Turn off all accessories. Disengage all power take-off units, if so equipped.
- C. With transmission in Neutral (M/T) or Park (A/T), start the engine. Run the engine until normal operating temperature is reached, and then, stop the engine.
- D. Remove the air cleaner assembly and plug the vacuum hose(s) to the assembly.
- E. Check throttle and choke linkages for freedom of movement. Correct as required.
- F. Disconnect system vacuum hose to the decel throttle control diaphragm and plug the hose.
- G. If so equipped, disconnect the fuel evaporative purge valve signal vacuum line as follows: Trace the purge valve vacuum line from the purge valve (located on the canister), to the first point where the vacuum line can be detached from the underhood hose routing, e.g.: vacuum "tee" connection, etc. Disconnect the vacuum line at that point, cap the open port, and plug the vacuum line.

CAUTION: To prevent damage to the purge valve, do not disconnect the vacuum line at the purge valve.

- H. Connect a tachometer.

II. Fast Idle Speed

- A. If the distributor vacuum line is equipped with a retard delay valve, remove the delay valve and install a jumper vacuum hose between the remaining vacuum hose ends.
- B. Disconnect the EGR vacuum hose at the EGR valve and plug the hose.
- C. With the engine at normal operating temperature and choke plate fully open, check fast idle speed as follows:

NOTE: Before each speed check, run engine at approximately 2500 rpm for 15 seconds in Neutral/Park.

- 1. For 2V Holley Carburetor Model 2300 EG (Manual Choke):
 - a. Pull the choke control (on the control panel) to fullchoke. The choke plate should now be closed.
 - b. Manually open the choke plate by pushing against the choke shaft lever until the choke link contacts the bottom or the slot in the choke shaft lever.
 - c. Check choke pulldown setting by inserting a 0.375 in. gauge between the choke plate and the air horn in the downstream side of the choke. If necessary, bend the choke lever stop tang to obtain specified pulldown setting.
 - d. Check fast idle speed (while the choke plate is being held against its stop). If necessary, adjust fast idle speed to specification using the fast idle adjusting screw. (Refer to the Vehicle Emission Control Information Decal for specified idle speed).
 - e. Repeat Steps a. thru d. until the specified idle speed can be repeated.
- 2. For 4V Holley Carburetor Model 4180 EG:

NOTE: To adjust the fast idle speed screw on the 4180 EG, use Kent-Moore Tool No. J-10176-K, or equivalent.

- a. Pull choke control to full choke position. Choke plate should be closed.
- b. Manually open the choke plate until it stops. Check choke pulldown setting by inserting a 0.210 in. gauge between the choke plate and the air horn in the downstream side of the choke. If necessary, bend the choke rod at the dog leg to obtain specified pulldown setting.
- c. Insert a 0.375 in. gauge in the downstream side of the choke plate and check fast idle speed. If necessary, adjust fast idle speed to specification, using the fast idle adjusting screw.
- d. Return choke plate to vertical position. (Choke off).
- e. Repeat Steps a. thru c. until the specified fast idle speed can be repeated.
- D. If the retard delay valve was removed, detach the jumper vacuum hose and reinstall the retard delay valve, making sure the white side of the retard delay valve faces away from the distributor vacuum advance unit.
- E. Reconnect the EGR vacuum hose at the EGR valve.

III. Curb Idle and Decel Throttle Control Speeds

NOTE: Steps A, C, and D of the following procedure are applicable only to engines having a decel throttle control mechanism.

- A. On engines equipped with **integral** decel throttle control diaphragm and TSP, check the decel throttle control engine speed as follows:
 - 1. If equipped with throttle solenoid, verify that the throttle solenoid is energized. Correct as required.
 - 2. Connect a slave vacuum hose from an engine manifold source to the diaphragm.
 - 3. Run the engine at approximately 2500 rpm for 15 seconds. Then release the throttle.
 - 4. **Integral Decel Throttle Control System Only:** Allow one (1) minute for the engine speed to stabilize. Then, compare engine speed to specification as listed on the Vehicle Emission Control Information Decal. If the engine speed is not to specification, adjust the solenoid positioner by rotating the long screw (part of the mounting bracket) until the specified engine speed is obtained.
 - 5. Allow engine to return to curb idle speed by disconnecting the slave manifold vacuum hose from the diaphragm and plugging the hose.
- B. Check the curb idle speed as follows:
 - 1. For carburetors equipped with a TSP device or a solenoid-dashpot, verify that the solenoid is energized. Correct as required.
 - 2. Run the engine at approximately 2500 rpm for 15 seconds, then allow engine to return to curb idle.
 - 3. Allow the engine speed to stabilize and compare curb idle engine speed to specification as listed on the Vehicle Emission Control Information Decal. If the engine speed is not to specification, adjust the curb idle speed as follows:

- a. On carburetors equipped with a separate TSP, adjust the solenoid positioner by rotating the long screw (part of the mounting bracket) until the specified curb idle speed is obtained.
- b. On carburetors equipped with the **integral** decel throttle control diaphragm and TSP or equipped with a solenoid-dashpot, rotate the hex head on the rear of the solenoid until the specified curb idle speed is obtained.
- c. On carburetors with no solenoid device, rotate the throttle adjusting screw until the specified curb idle speed is obtained.

NOTE: Check dashpot clearance, if equipped, each time the curb idle speed is adjusted. Collapse the dashpot stem and check the clearance between the collapsed stem and the throttle lever pad. Adjust if not to specification. (Refer to Truck Performance Specifications Book).

- 4. Repeat Steps 2 and 3 until the specified curb idle speed is repeatable.
- C. On engines equipped with **integral** decel throttle control diaphragm and TSP, repeat Steps A and B until both specified engine speeds are repeatable.
- D. On engines equipped with **separate** decel throttle control diaphragm and TSP, check the decel throttle control engine speed as follows:
 - 1. Make sure the curb idle speed is adjusted to specification in accordance with Step B.
 - 2. Connect a slave vacuum hose from an engine manifold vacuum source to the diaphragm.
 - 3. With the transmission selector in Neutral/Park, run the engine at approximately 2500 rpm for 15 seconds. Then, release throttle.
 - 4. Allow one (1) minute for the engine speed to stabilize; then compare the engine speed to specification as specified on the Vehicle Emission Control Information Decal. If the engine speed is not to specification, adjust the diaphragm positioner by loosening the lock nut on the positioner and rotate the positioner until the specified engine speed is obtained. Retighten the lock nut.
 - 5. Allow the engine to return to curb idle speed by disconnecting the slave manifold vacuum hose from the diaphragm and plugging the hose.
 - 6. Repeat Steps 1 thru 4 until the specified engine speeds are repeatable.
- E. Check the dash pot clearance, if so equipped. Collapse the dash pot stem and check the clearance between the collapsed dash pot stem and the throttle lever pad. Adjust if not to specification. (Refer to the Truck Performance Specifications Book).

IV. TSP OFF Idle Speed

- A. With the engine idling and the transmission selector in Neutral/Park, collapse the solenoid plunger by forcing the throttle lever pad against the plunger.

- B. Measure the TSP OFF idle speed and compare to specification as listed on Vehicle Emissions Control Information Decal. If the engine speed is not within specification, adjust the throttle adjusting screw until the specified engine speed is obtained.

V. Post Adjustment Instructions

- A. Remove the slave manifold vacuum hose from the engine and connect the decel throttle control vacuum hose to the diaphragm.
- B. Reinstall the air cleaner assembly and reconnect vacuum hose(s).
- C. Recheck curb idle speed. Adjust if not to specifications.
NOTE: Final curb idle speed must be taken with the air cleaner assembly installed.
- D. Stop the engine. Remove all test equipment and tighten the air cleaner wing nut(s) to specification.

7.5L (460 CID) WITH HOLLEY 4180-C (TRUCKS OVER 8500 GVW) (INCLUDES DECEL THROTTLE CONTROL SPEEDS WHEN APPLICABLE)

I. Pre-Adjustment Instructions

- A. Apply parking brake and block the wheels.
- B. Turn off all accessories. Disengage all power take-off units, if so equipped.
- C. With transmission in Neutral (M/T) or Park (A/T), start the engine. Run the engine until normal operating temperature is reached, and then, stop the engine.
- D. Remove the air cleaner assembly and plug the vacuum hose(s) to the assembly.
- E. Check throttle and choke linkages for freedom of movement. Correct as required.
- F. Disconnect system vacuum hose to the decal throttle control diaphragm and plug the hose.
- G. If so equipped, disconnect the fuel evaporative purge valve signal vacuum line as follows: Trace the purge valve vacuum line from the purge valve (located on the canister), to the first point where the vacuum line can be detached from the underhood hose routing e.g.: vacuum "tee" connection, etc. Disconnect the vacuum line at that point, cap the open port, and plug the vacuum line.
CAUTION: To prevent damage to the purge valve, do not disconnect the vacuum line at the purge valve.
- H. Connect a tachometer.

II. Fast Idle Speed

- A. If the engine is equipped with a spark delay valve, remove the delay valve and install a jumper vacuum hose between the remaining vacuum hose ends.
- B. Disconnect the EGR vacuum hose at the EGR valve and plug the hose.
- C. With the engine at normal operating temperature and choke plate fully open, check fast idle speed as follows:

NOTE: Before each speed check, run engine at approximately 2500 rpm for 15 seconds in Neutral/Park.

1. Depress the throttle lever and manually rotate the fast idle cam until the fast idle adjusting screw rests on the specified step of the cam. (Refer to the Vehicle Emission Control Information Decal for specified cam setting and idle speed).
2. Check fast idle speed and compare to specification. If necessary, adjust the fast idle speed adjusting screw.
3. Repeat Steps 1 and 2 until specified fast idle speed can be repeated.
- D. If the spark delay valve was removed, detach the jumper vacuum hose and reinstall the delay valve, making sure the white side of the delay valve faces the distributor advance unit.
- E. Reconnect the EGR vacuum hose at the EGR valve.

III. Curb Idle and Decel Throttle Control Speeds

- A. On engines equipped with a decel throttle control diaphragm, check the curb idle and decel throttle control engine speeds as follows:
- B. Check the curb idle speed as follows:
 1. Run the engine at approximately 2500 rpm for 15 seconds and then allow engine to return to curb idle.
 2. Allow the engine to stabilize and compare curb idle engine speed to specification as listed on the Vehicle Emission Control Information Decal. If engine speed is not within specification adjust the curb idle speed by rotating the throttle adjusting screw until the specified curb idle speed is obtained.
 3. Repeat Steps 1 and 2 until the specified curb idle speed is repeatable.
- C. On engines equipped with decel throttle control diaphragm check the decel throttle control engine speed as follows:
 1. Make sure the curb idle speed is adjusted to specification in accordance with Step B.
 2. Connect a slave vacuum hose from an engine manifold source to the diaphragm.
 3. With the transmission selector in Neutral/Park, run the engine at approximately 2500 rpm for 15 seconds. Then, release the throttle.
 4. Allow one (1) minute for the engine speed to stabilize; then compare the engine speed to specification. (Refer to the Vehicle Emission Control Information Decal). If the engine speed is not to specification, adjust the diaphragm positioner by loosening the lock nut on the positioner and rotate the positioner until the specified engine speed is obtained. Retighten the lock nut.
 5. Allow the engine to return to curb idle speed by disconnecting the slave manifold vacuum hose from the diaphragm and plugging the hose.
 6. Repeat Steps 1 through 5 until the specified engine speeds are repeatable.

IV. Post Adjustment Instructions.

- A. Remove the slave manifold vacuum hose from the engine and reconnect the decel throttle control vacuum hose to the diaphragm.

- B. Reinstall the air cleaner assembly and reconnect vacuum hose(s).
- C. Recheck curb idle speed. Adjust if not to specification.
NOTE: Final curb idle speed must be taken with the air cleaner assembly installed.
- D. Stop the engine. Remove all test equipment and tighten the air cleaner wing nut(s) to specification.

7.8L(477 CID) AND 8.8L (534 CID) WITH 4150 EG-4V HOLLEY (TRUCKS OVER 8500 GVW) (INCLUDES DECEL THROTTLE CONTROL SPEEDS WHEN APPLICABLE)

1. Pre-adjustment Instructions

- A. Apply parking brake and block the wheels.
- B. Turn off all accessories. Disengage all power take-off units, if so equipped.
- C. With transmission Neutral (M/T) or Park (A/T), start the engine. Run the engine until normal operating temperature is reached, and then, stop the engine.
- D. Remove the air cleaner assembly and plug the vacuum hose(s) to the assembly.
- E. Check throttle and choke linkages for freedom of movement. Correct as required.
- F. Disconnect system vacuum hose to the decel throttle control diaphragm and plug the hose.
- G. If so equipped, disconnect the fuel evaporative purge valve signal vacuum line as follows: Trace the purge valve vacuum line from the purge valve (located on the canister), to the first point where the vacuum line can be detached from the underhood hose routing, e.g.: vacuum "tee" connection, etc. Disconnect the vacuum line at that point, cap the open port, and plug the vacuum line.
CAUTION: To prevent damage to the purge valve, do not disconnect the vacuum line at the purge valve.
- H. Connect a tachometer.

II. Fast Idle Speed

NOTE: To adjust the fast idle speed screw on the 4150-G carburetors use Kent-Moore Tool No. J-10176-K, or equivalent.

- A. With the engine at normal operating temperature and choke plate fully open, check fast idle speed as follows:
NOTE: Before each speed check, run engine at approximately 2500 rpm for 15 seconds in Neutral/Park.
 1. Pull choke control to full choke position. Choke plate should be closed.
 2. Insert a 0.375 in. gauge between choke plate and air horn in the down-stream side of the choke plate.
 3. With gauge in place, as described above, check fast idle speed. If necessary, adjust fast idle speed to specification as listed on the Vehicle Emission Control Information Decal, using the fast idle adjusting screw.
 4. Return choke control to choke OFF position.

5. Repeat Steps 1-4 until the specified fast idle speed can be repeated.

III. Curb Idle and Decel Throttle Control Speeds

- A. Check the decel throttle control engine speed as follows: Disconnect the vacuum hose from the decel throttle control diaphragm and plug the hose.
 1. Connect a slave vacuum hose from an engine manifold vacuum source to the decel throttle control diaphragm.
 2. Run the engine at approximately 2500 rpm for 15 seconds; then release the throttle.
 3. Allow one (1) minute for the engine speed to stabilize. Then compare engine speed to specification listed on the Vehicle Emission Control Information Decal. If engine speed is not to specification, adjust the solenoid positioner by rotating the screw in the diaphragm housing until the specified engine speed is obtained.
 4. Allow the engine to return to curb idle speed by disconnecting the slave manifold vacuum hose from the diaphragm and plugging the hose.
- B. Check curb idle speed as follows:
 1. Run the engine at approximately 2500 rpm for 15 seconds and then allow engine to return to curb idle.
 2. Allow the engine speed to stabilize and compare curb-idle engine speed to the specification listed on Vehicle Emission Control Information Decal. If the engine speed is not within specification, adjust the curb idle speed adjusting screw until specified engine speed is obtained.
 3. Repeat Steps 1 and 2 until the specified curb idle speed is repeatable.

V. Post Adjustment Instructions

- A. Remove the slave manifold vacuum hose from the engine and reconnect the decel throttle control vacuum hose to the diaphragm.
- B. Reinstall the air cleaner assembly and reconnect vacuum hose(s).
- C. Recheck curb idle speed. Adjust if not to specification.
NOTE: Final curb idle speed must be taken with the air cleaner assembly installed.
- D. Stop the engine. Remove all test equipment and tighten the air cleaner wing nut(s) to specification.

CHECK AND ADJUST ENGINE TIMING

1. Clean the surface of the front damper and place a mark on the proper degree line on the damper. On some engines, place a mark on the proper degree line of the pointer bracket and another in the damper notch.
2. Disconnect the vacuum line(s) to the distributor and plug.
3. Connect a suitable timing light or magnetic pick-up timing and advance meter and tachometer to the engine.
4. Start the engine and warm up. Check idle speed and adjust as necessary.
5. Check and adjust engine timing to the specification shown on the Vehicle Emission Control Information Decal.
6. If engine timing requires adjustment, the idle speeds should also be checked and, if necessary, re-adjusted.

CHECK ENGINE DRIVEABILITY (DURING ROAD TEST)

During start up, acceleration, cruise and deceleration, check for unsatisfactory engine performance such as:

- Prolonged starting (cranking).
- Hard starting (does not quite catch).
- False starts (quits immediately after starting).
- Idles rough, stalls.
- Idles unusually slow.
- Idles unusually fast (races, pulls).
- Stumbles, backfires, stalls or hesitates during accels.
- Spark knock during light to moderate accels.
- Sluggish, poor acceleration.
- Surges or lopes.
- Hissing, unusual noises or vibration under hood.
- Smokes.
- Does not shift properly (hard shifting or engaging, delays or jerks).
- Any other unsatisfactory condition observed by mechanic.

Necessary repairs may be claimed under provisions of the warranty.

CHECK ENGINE AIR INTAKE AND BREATHER CAP INSTALLATION

Inspect for alignment and/or damage. Correct as necessary.

OTHER UNDERHOOD OPERATIONS**CHECK ENGINE OIL LEVEL**

On all engines, the oil level should be within the SAFE range on the dipstick. Add oil as required.

On 7.8L (477 CID) V-8 and 8.8L (534 CID) V-8 engines, the oil level dipstick must be installed with the dipstick handle facing away from the engine or erroneous readings may result.

CHECK BRAKE MASTER CYLINDER FLUID LEVEL

Push the master cylinder cap retainer to one side and remove the filler cap from the master cylinder. The gasket which seals the master cylinder should come off

with the cap. Fill both reservoirs full or 1/4 inch from the top. Install the filler cap, making sure the gasket is properly seated in the cap. Use only brake fluid meeting specifications (ESA-M6C25A or equivalent).

CHECK HYDRAULIC CLUTCH MASTER CYLINDER FLUID LEVEL

The clutch master cylinder reservoir should be filled to within 1/2 inch from the top. Use only the specified fluid (Part 50-03).

CHECK OIL BATH AIR CLEANER OIL LEVEL

Remove the reservoir from the air cleaner body. Fill the reservoir to the oil level mark, if necessary, with the specified motor oil. Do not over-fill the reservoir.

CHECK WINDSHIELD AND REAR WINDOW WASHER RESERVOIR LEVEL

Add fluid as necessary.

CHECK AUTOMATIC TRANSMISSION FLUID LEVEL (HOT) (All Except Allison AT 540, 643 and 653)**With Transmission Hot (Operating Temperature)**

The automatic transmission is designed to operate with the oil level between the ADD and FULL mark on the dipstick at an operating temperature of 150°F to 170°F, (dipstick is hot to the touch) and should be checked at those temperatures. The operating temperature may be obtained by driving 15 to 20 miles of city type driving with the outside temperature above 50°F. Check the fluid level as follows:

1. With transmission in PARK position, engine at curb idle rpm, foot brakes applied and vehicle on level surface, move the transmission selector lever through each range, allowing time in each range to engage transmission. Return to PARK position, and apply parking brake.
Do not turn off the engine during the fluid level check.
2. Clean all dirt from the transmission fluid dipstick cap before removing the dipstick from the filler tube.
3. Pull the dipstick out of the tube, wipe it clean, and push it all the way back into the tube. Be sure it is fully seated.
4. With transmission at operating temperature (150°F to 170°F): Pull the dipstick out of the tube again and check the fluid level. The fluid level should be between the add and full mark. If

additional fluid is required, add enough fluid through the filler tube to bring level between the add and full marks on the dipstick.

Do not overfill the transmission, as foaming and loss of fluid through the vent may result in transmission malfunction. If the transmission is operated with the fluid level too low, extreme cold temperatures can cause the fluid to contract and may result in transmission malfunction.

5. Insert the dipstick, **making sure it is fully seated in the tube.**

CHECK AUTOMATIC TRANSMISSION FLUID LEVEL (Allison AT 540, 643 and 653 Transmissions)

With the truck standing level, parking brake applied, start the engine and move the transmission shift lever through all the shift positions, allowing sufficient time in each range to engage the transmission, stopping at neutral position. The engine should be running at idle and the transmission and engine at operating temperature. Do not turn the engine off during the fluid level check.

1. Clean all dirt from the transmission fluid dipstick cap before removing the dipstick from the filler tube.
2. Pull the dipstick out of the tube, wipe it clean, and push it back into the tube. Be sure it is fully seated.
3. Note: The dipstick has two (2) hot marks and two (2) cold marks between the ADD and FULL marks.
4. **HOT OIL CHECK**

Engine idling and transmission at normal temperature 160°-200° F. (71°-93° C). Pull the dipstick out and check fluid level. The level should be between the two top "Hot Marks".

If additional fluid is required, add enough fluid through the filler tube to bring the level between the ADD and FULL marks on the dipstick. Do not overfill the transmission, as foaming and loss of fluid through the vent may result in transmission malfunction.

5. **COLD OIL CHECK**

Engine idling and transmission at 60°-120° F (16°-49° C) cool to touch. Pull the dipstick out and check the fluid level. The fluid level should be between the two bottom (cold) marks. If additional fluid is required, add oil to bring the oil level to the middle of the "Cold Marks".

6. Replace the dipstick in the tube, making sure it is fully seated.

CHECK POWER STEERING PUMP RESERVOIR FLUID LEVEL (HOT)

Run the engine until the fluid is at normal operating temperature, turn the steering wheel all the way to the left and right several times, and shut off the engine.

Check the fluid level in the power steering reservoir. The level must show between the cold full mark and the bottom of the dipstick when cold, or between the full cold and full hot marks when hot. Do not overfill. Remove excess fluid with a suction device. Check for adequate power steering hose clearances to moving parts (belts, pulleys) and the exhaust manifold.

If the level is low, add power steering fluid meeting specifications to the proper level on the dipstick.

CHECK BATTERY CHARGE

CHECK BATTERY CHARGE—NON-MAINTENANCE FREE BATTERY

With battery temperature at 80° F the battery should have a specific gravity reading of not less than 1.230. If the battery requires charging, refer to the specification chart in this section for battery charging rates.

MAINTENANCE FREE BATTERY

With the engine off, turn headlights on for 10 seconds and wait for five minutes to stabilize the battery. Place voltmeter leads on the battery. Place voltmeter leads on the battery terminals and check for open circuit voltage. The minimum open circuit voltage is 12.45. If the battery is below 12.45 open circuit voltage, recharge according to the allowable battery charge time schedule for maintenance free batteries. Refer to the Specification Chart in this section for battery charge time schedule. Do not exceed a 30 amp charge rate. If gassing or spewing of the electrolyte occurs during charging, the charge rate must be reduced.

COOLING SYSTEM

Check for leaking radiator hoses. Make sure all supporting brackets for hoses and pipes are in place and installed properly in the supports.

BODY—CAB

Install Loose Items—Such as Wheel Covers, Cigar Lighter, Antenna, Exterior Mirrors and Other Optional Equipment

■ WHEEL COVERS

Center the tire valve stem in the wheel cover hole and position the cover on the wheel with the valve stem side of cover tight against wheel. Use rubber mallet to tap cover in place beginning on outer perimeter opposite valve stem.

NOTE: Never apply mallet to any part of the wheel cover other than the outer rim as the cover may be dented or distorted. Be sure cover is fully seated against wheel all around perimeter of cover.

■ OTHER OPTIONAL EQUIPMENT

Check type and location specified, and install, using installation instructions and template supplied.

CHECK OPERATION OF DOORS, HOOD AND GLOVE BOX

Be sure all doors open easily and close securely without being slammed.

CHECK OPERATION OF ALL LOCKS AND KEYS

Be sure all doors lock and unlock from both inside and outside the vehicle.

CHECK OPERATION OF WINDOWS AND VENTS

Check ease of operation, matching position of both window handles, and tight fit against weatherstrip.

CHECK OPERATION OF SEATS AND SEATBACK LATCHES

Check lever operation and test freeness of seat movement on track and solid lock in detent when lever is released. If equipped with suspension seats, check for proper functioning of all controls.

Be sure latches operate properly and retain seatback.

CHASSIS**CHECK AND TOP-UP FLUID LEVELS IN MANUAL TRANSMISSION AND AXLE****■ MANUAL SHIFT TRANSMISSION AND 4X4 TRANSFER CASE LUBRICANT LEVEL**

Clean dirt and grease from the area around the filler plug and remove the filler plug from the side of the case.

If lubricant does not flow from the filler hole, fill the case with the specified lubricant (ESP-M2C138-CJ) or equivalent until it is level with the bottom of the filler hole. Install the filler plug.

■ AXLE LUBRICANT LEVEL

Clean dirt and grease from the area around the filler plug, and check level. When checking, the axle must be in normal curb position. Replace the filler plug.

ADJUST TIRE PRESSURES TO SPECIFICATION

Be sure pressure agrees with specifications for the tire and vehicle model. Refer to Part 11-01.

CHECK EXHAUST SYSTEM, STEERING GEAR AND FLEX COUPLING, STEERING LINKAGE, SUSPENSION, AND FLUID LINES FOR DAMAGE OR LOOSE FASTENERS**■ EXHAUST SYSTEM INCLUDING EXTENSION AND RAIN CAP**

Inspect for proper assembly and components. Check for adequate clearance to adjacent parts.

■ STEERING

Check the steering gear attaching bolts to be sure they are tightened.

Check the linkage for tightness and proper installation of cotter pins.

■ FRONT AND REAR SUSPENSION

Inspect the front and rear suspension for proper assembly and components. Check to be sure all lock tabs are bent for nut and bolt retention and that all cotter pins are properly installed.

■ COOLING SYSTEM, HOSES AND LINES

Check for leaking radiator hoses.

Make sure all supporting brackets for hoses are in place and that the hoses are properly installed in the supports.

REMOVE TRANSIT BRACKETS

Remove transit brackets and spring insulators and discard from applicable vehicle.

LIGHT TRUCK—TORQUE DUAL WHEEL NUTS TO SPECIFICATION**MEDIUM/HEAVY TRUCK AND B-SERIES—TORQUE ALL WHEEL NUTS TO SPECIFICATION**

Wheel stud nuts and clamps should be tightened alternately and evenly to draw the wheel evenly against the hub and drum.

On dual wheels, back off the outer nut before tightening inner stud. Then tighten outer nut. Some dual wheels are alternately flared inward and outward. These surfaces must be mated when wheels are mounted.

Tighten all stud nuts to recommended specification for the vehicle and wheel type (see Specifications at the end of this Part).

TRANSMISSION AND ENGINE MOUNTS

Visually inspect engine and transmission fasteners; tighten as required. Refer to Medium/Heavy Truck Shop Manual Part 16-10, General Torque Specifications.

FLUID LINES, AIRLINES, AND ELECTRICAL HARNESS

Check lines, fittings, connections and components on under side for proper assembly and leaks (including air brake system). Visually inspect electrical harness routings and connectors. Inspect for loose connections and loose fasteners. After road test, check for fluid leaks and correct as necessary.

■ HYDRAULIC BRAKE SYSTEM HOSES AND LINES

Check lines and hoses for fluid leaks and loose connections, kinks and interference with adjacent moving or frictional components. Check brake booster and master cylinder for vacuum and fluid leaks. Tighten and correct as required.

■ AIR BRAKE SYSTEM

Check for evidence of leakage at all fittings. Inspect lines for kinks and interference with adjacent moving or frictional components. Make sure there is as much clearance as possible between air brake and exhaust systems. Tighten and correct as required.

■ AIR BRAKE SYSTEM LEAK TESTS

With engine stopped and reservoir charged to governor cutout pressure of 115 to 125 psi, the rate of pressure drop should not exceed 2 psi per minute with the service brakes released and spring (parking) brakes applied; or 3 psi per minute after the initial pressure drop with service brakes fully applied and spring (parking) brakes applied.

TORQUE REAR AXLE SHAFT FLANGE NUTS ON SADDLE MOUNTED DELIVERIES (ALL)**INSTALL NEW GASKETS ON SADDLE MOUNTED VEHICLE (IF REQUIRED, AND TORQUE REAR AXLE FLANGE ON B-SERIES)**

Be sure nuts are tightened to the specified torque. Use a criss-cross sequence for even tightening. Refer to the specification chart in this section for correct torque limits.

CHECK REAR BRAKE ADJUSTMENT ON SADDLE MOUNTED DELIVERIES

Raise the vehicle on a hoist. While rotating the drum forward, verify that both primary and secondary shoes slightly drag on the drum.

CHECK TORQUE ON FRONT AND REAR U-BOLTS

Refer to the specifications chart in this section for correct torque limits.

CHECK FRONT WHEEL TOE-IN AND ADJUST AS REQUIRED—(MEDIUM, HEAVY AND B-SERIES ONLY)

Refer to the Specifications Chart in this Part for correct Toe-in settings.

If the toe is incorrect, loosen the clamp bolts at each end of the spindle connecting rod tube. Rotate the tube until the correct toe is obtained, and tighten to 31-42 ft-lb for 1/2-20 clamp bolts or 50-70 ft-lb for 5/8-18 clamp bolts. Recheck the toe to make sure that no changes occurred when the bolts were tightened.

ROAD TEST**CHECK STEERING COLUMN LOCK**

Place transmission selector lever in PARK position on vehicles equipped with column shift automatic transmission; place in any position if equipped with manual transmission. Turn key to LOCK position. Manual transmission and floor shift models are equipped with lock button on the left side of steering column, which must be depressed first.

Turn the steering wheel left or right slightly, until it snaps into the lock detent.

Check to see if the steering wheel is locked in both directions. The selector lever will remain locked in PARK position on the column-shift vehicles only. The key can be removed from the ignition lock in LOCK position only. With key in the ignition lock, open driver's door to check operation of key removal warning buzzer.

CHECK STARTING OF ENGINE IN PARK AND NEUTRAL

Engine should start with shift lever in **NEUTRAL** and/or **PARK** positions only. If equipped with Transmatic transmission, adjust switch to start engine with the shift lever in **NEUTRAL** position only. Refer to the Maintenance Section of this Part for the band adjustment procedure.

CHECK OPERATION OF HORN, WINDSHIELD WIPER AND WASHER, LIGHTS, SIGNALS AND INSTRUMENTS**■ HORNS**

Check to be sure horn(s) blow at all contact positions.

■ WINDSHIELD WIPER AND WASHER

Check for proper operation, including wiper sweep and park.

■ LIGHTS AND SIGNALS

Check switches and brightness of lights, including operation of oil pressure and alternator warning lights. Check detent action and return of turn signal

lever by making full left and full right turns during road test.

■ SPEEDOMETER, ODOMETER AND TACHOMETER

Verify that gauges operate and needles do not bounce.

■ ALTERNATOR AND VOLTAGE REGULATOR

Turn headlights on and check the charge indicator gauge or light to be sure charging system is not discharging.

CHECK OPERATION OF HEATER, AIR CONDITIONER, DEFROSTER, VENTILATION SYSTEM, RADIO, SEAT BELT WARNING SYSTEM AND ALL OTHER OPTIONAL EQUIPMENT**■ HEATER, DEFROSTER**

Place selector lever in HEAT position. Move blower switch through each speed position and check for corresponding change in air discharge at outlets. Move temperature control lever through entire range and check for proper change in discharge air temperature. Repeat this procedure in DEFROST position and check for air discharge through defroster nozzles.

■ AIR CONDITIONER

Place function selector lever in A/C and the temperature selector in COOL. Increase engine speed to approximately 1500 rpm. Econoline Only: After approximately one minute, check the sight glass. A continuous or large amount of bubbles during compressor operation indicates a refrigerant undercharge. If an undercharge is found, check and repair any leaks, evacuate the system, and charge with the proper amount of refrigerant-12. If the sight glass is clear, a cold suction tube at the compressor indicates that the system is working properly. F-Series, Bronco and Econoline: After approximately one minute, check for cool air discharge at each A/C register in each blower speed position. Also, check register(s) for direction and volume control. Check temperature modulation by moving control lever slowly to WARM position. Return lever to COOL position.

■ FRESH AIR VENTS

Check all vents by operating vent controls.

■ RADIO

Check for proper operation of radio and tape player, if so equipped. Set radio push-buttons for local stations.

■ SEATS AND SHOULDER BELTS

Check seat belt warning system for proper operation. Check automatic retractors for full extension, retraction and retention of belt. Check buckle and clasp for proper retention, release, and length adjustment.

CHECK BRAKES (INCLUDING PARKING BRAKE AND WARNING LIGHT)

Check foot brake pedal height before road testing. Then check and correct the following, as required: Pull in either direction, harshness or noise, excessive pedal effort, or spongy feel and operation of the warning light. Avoid sudden hard stops—make slow, gradual

stops. On all F100-350, Bronco, and E100-350, it may be necessary to make a few reverse stops to fully adjust the rear brakes.

Check the operation of the parking brake and indicator light. If equipped with an indicator light, be sure it glows when parking brake is engaged.

PARKING BRAKE BURNISHING—TRUCKS EQUIPPED WITH TRANSMISSION MOUNTED PARKING BRAKE

600-900 SERIES

Perform the following burnishing procedure on new vehicles and whenever the parking brake lining and/or drum is replaced.

Vehicles with Orscheln Lever

1. With the parking brake released, turn the handle knob until a force of at least 70 lbs. is required to apply the brake over center position of the lever.
2. Make four stops from 20 MPH on a dry hard surface road, using only the parking brake to stop the vehicle. After each stop, release the brake and drive the vehicle at 20 MPH for 2.5 miles.
3. Readjust the lever handle until a force of approximately 90 pounds is required to pull the lever over center.

Vehicles with Conventional Lever

1. Make four stops from 20 MPH on a dry hard surface road, using only the parking brake to stop the vehicle, and pulling on the brake lever with a force of 70 lbs. After each stop, release the brake and drive the vehicle at 20 MPH for 2.5 miles.

CHECK STEERING CONTROL

Road test the vehicle, and check for harshness, noise, wander or free play. Check steering wheel return for stiffness or inconsistency in either direction. Correct as required.

CHECK AUTOMATIC TRANSMISSION OR MANUAL TRANSMISSION AND CLUTCH PERFORMANCE—EXCEPT BRONCO, F100-F350, E100-E350

■ SELECTOR LINKAGE

Move the selector lever from 1 to R. Six definite detent positions 1, 2, 2-4, 2-5, N and R should be felt

as the lever moves from front to rear on MT-653 transmissions. For MT-643 transmissions the detent positions are 1, 2, 3, D, N and R.

If equipped with manual transmission, check for smooth shifting through all gears.

■ THROTTLE LINKAGE

When the throttle linkage is properly adjusted, maximum engine performance in starting and accelerating a heavily loaded truck is obtained automatically. The driver need only depress the accelerator pedal to the detent and hold it there. With the accelerator pedal held at the detent, the transmission will stay in the starting gear until engine crankshaft speed approaches the engine governed speed (maximum engine performance), then it will shift into the next higher gear. The automatic, full throttle (at detent) shifting just under governed speed will continue until the highest gear or desired road speed is reached.

■ TRANSFER CASE

Be sure case shifts properly from one range to another. Check 4-wheel drive engagement and disengagement.

■ CLUTCH

Check free travel and full return of clutch pedal and disengagement of the clutch. Check for chatter, slipping, excessive pedal effort or noise. Refer to the Specification Section of this Part for free travel measurements. Adjust, if required, as outlined in Maintenance.

■ SHIFT TIMING AND QUALITY

Both up and down shifts should be smooth and correctly timed. Adjust, if necessary.

OPERATION OF 2-SPEED AXLE

Operate axle control switch, and check for correct shift, engagement and operation.

CHECK FOR SQUEAKS, RATTLES AND BELT NOISE

Throughout the road test and especially on rough roads, listen for squeaks or rattles.

Listen for anything loose and for objectionable wind noise or vibration.

APPEARANCE

WASH AND PERFORM DETAILED CLEAN UP OF INTERIOR AND EXTERIOR

Remove all shipping covers from vehicle except the tape under the hood flange on L-Series trucks. **This tape should not be removed.**

Remove the windshield markings and tapes. Wash the vehicle and check for leaks. Inspect metal and paint condition, and touch up chips and scratches. Check for excess sealer.

CAUTION: Do not use steel wool, abrasive type cleaners, or strong detergents containing highly alkaline or caustic agents on chrome plated

materials, aluminum wheels, or anodized aluminum parts because the protective coating may be damaged and cause discoloration or paint deterioration.

CHECK EXTERIOR AND INTERIOR FOR PROPER APPEARANCE AND FIT

Inspect the body exterior for door and hood gaps or evidence of rubbing or binding with adjacent panels. Check exterior moldings for adequate retention or extreme misalignment. Inspect bumpers for appearance.

Inspect interior paint, for chips and scratches. Check for safe trim sealer and excess sealer.

TOUCH UP MINOR PAINT BLEMISHES—BRUSH, AEROSOL CAN AND/OR SPOT POLISH

Check for any imperfections in paint and metal finish.

Correct minor chips and scratches with brush or spray can touch-up paint and polish out any surface blemishes.

CHECK FOR NECESSARY OWNER INFORMATION MATERIAL IN GLOVE BOX

Check glove compartment for:

- Warranty Facts Booklet
- Ownercard
- Owner Guide
- Consumer Information Folder
- Other Owner Publications

See that the starting instructions sleeve is on the left hand visor.

REMOVE SEAT AND CARPET PROTECTIVE COVERS

Remove the plastic covers from the upholstery. See that there are no stains or dirt on the upholstery.

Remove protective covers from the carpeting and make sure there is no dirt beneath them.

B-SERIES ONLY

CHECK AND ADJUST DRIVE BELT TENSION (B-SERIES ONLY)

NOTE: Due to space limitations, it may be necessary to remove components to gain access for inspecting, checking, or replacing accessory drive belts.

CAUTION: On dual belt accessory drive, the belts must be replaced in matched sets.

Bring the engine to normal operating temperature and turn the engine off. Using the Rotunda belt tension gauge (Models—10019 and 210020) or equivalent, check the tension of all drive belts; on dual drive belts, check only one belt (Fig. 3). Compare measured tension to specification. (Refer to the appropriate part in the 1980 Truck Shop Manual.)

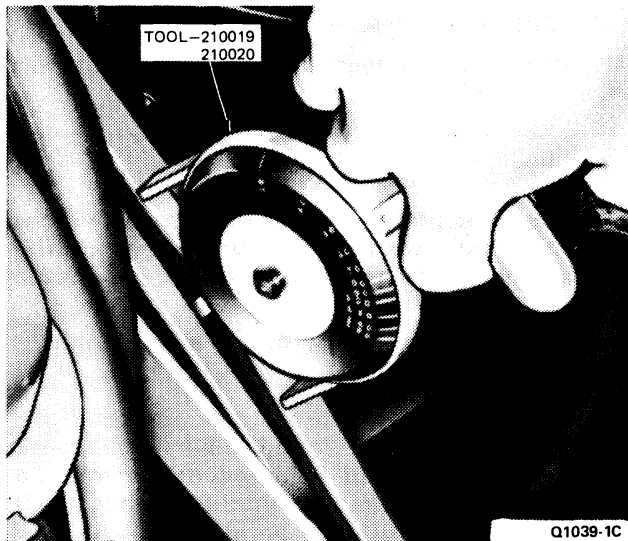


FIG. 3 Checking Belt Tension

NOTE: A belt tension gauge offers the most accurate means of checking belt tension. Accordingly, a belt tension gauge should be used whenever possible; removal of fan shroud, air induction hardware, etc., may be necessary. If space limitations, however, make it absolutely impossible to use a tension gauge, the following procedure may be substituted:

- a. Press firmly on the belt (approximately at the middle of the free span between pulleys).
- b. Belt deflection should be as follows:
 - For all belts with a free span less than 12", deflection should be between 1/8" and 1/4".
 - For all belts with a free span greater than 12", deflection should be between 1/8" and 3/8".

CHECK STEERING FLEX COUPLER FOR FLATNESS (B-SERIES ONLY)

A twisted or bent flex coupler could indicate a bind in the steering linkage. Correct as necessary.

STEERING GEAR HOUSING LUBRICANT LEVEL CHECK—

Check steering gear lubricant and fill as required (B-Series only).

CHECK BATTERY CABLES FOR TIGHTNESS AND PROPER ASSEMBLY (B-SERIES ONLY)

Check battery cable connections for tightness. Battery cables must be tight in terminals and terminals tight to posts after installation. A light coating of non-metallic grease can be applied to terminals and posts to retard corrosion and oxidation. Correct as necessary.

CHECK ELECTRICAL CONNECTIONS AND ROUTING (B-SERIES ONLY)

All visible electrical parts should be visually inspected to assure that they are properly seated. If unit is equipped with optional side mounted battery(s), the cables should be inspected to assure that they do not touch the exhaust or rub frame rails.

CHECK HEADLIGHT AIM AND ADJUST AS REQUIRED (B-SERIES ONLY)

Check the headlights for proper alignment. If necessary, align the headlights using the Headlight Aiming Kit—Model T.R.E 540 or equivalent. Be sure to use the latest manufacturers instructions.

■ AIR PRESSURE BUZZER AND GAUGE OPERATION (B-SERIES ONLY)

Operate brakes to drop pressure below 40 psi. With engine running, buzzer should sound and continue sounding until pressure builds to 58-65 psi.

■ AIR COMPRESSOR GOVERNOR OPERATION (B-SERIES ONLY)

With engine running, the instrument panel gauge should show governor cut-out at 115-125 psi, and cut-in at 95-100 psi. Adjust if required.

Perform Air System Leakdown Check—Service Brakes (Spring Brakes in Released Position)—B Series Only

With engine stopped and reservoirs charged to governor cutout pressure (120-125 psi) the rate of drop shall not exceed one psi per minute.

With engine stopped and reservoirs charged to governor cutoff pressure (120-125 psi) the rate of drop shall not exceed two psi per minute with brakes fully applied.

CHECK FRONT WHEEL BEARING ADJUSTMENT (B-SERIES ONLY)

When the wheel is off the ground, grasp tire at sides and alternately push inward and pull outward on the tire. If any looseness is felt, adjust the wheel bearing as described.

After adjusting, check front wheel rotation. If the wheel rotates freely with no noticeable end play, install the grease cap and hub cap; if loose or rough, inspect cones, rollers and cups and replace or repack as necessary.

CHECK STEERING MOUNTING, STOP ADJUSTMENT, LINKAGE AND CONNECTIONS INCLUDING CLEAR VISION (B-SERIES ONLY)

■ STEERING MOUNTINGS, LINKAGE AND CONNECTIONS

Check the steering gear attaching bolts to be sure they are tightened to specifications. Tighten the attaching bolts to specifications, if necessary.

Check the linkage for tightness and proper installation of cotter pins. Correct as required.

■ STEERING STOP ADJUSTMENTS

(Fig. 4) shows the position of the front wheels when checking the stop adjustment angles shown in specification charts at the end of this Part.

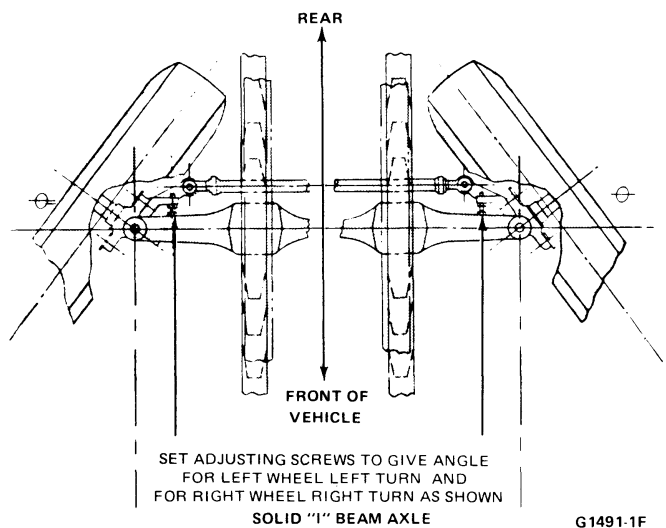


FIG. 4 Spindle Arm Stop Adjustment—All Except Twin-I-Beam Vehicles

■ CLEAR VISION

After the toe has been checked and/or adjusted, the steering wheel clear vision should be checked. If the wheel is 15 degrees off center in either direction, it should be removed and repositioned. When assembling the steering wheel, the attaching nut must be restaked.

DRAIN AIR BRAKE RESERVOIR (B-SERIES ONLY)

On units with drain cocks, the valve should be opened to check reservoir drain. On units with automatic moisture ejectors, the reservoir drain should be checked by depressing the valve stem in the center of the ejector.

LUBE REAR SPRING PINS AND ALL CHASSIS COMPONENTS (B-SERIES ONLY)

Refer to specifications chart in 50-03. Lubrication Charts and Lubricant Specifications for lubrication information.

INSPECT DRIVELINE FOR PROPER ASSEMBLY (B-SERIES ONLY)

Check that driveshaft guards are installed and U-joint attaching parts are secure. Also check that driveline is correctly phased. Refer to the 1980 Medium-Heavy Truck Body, Chassis and Electrical Shop Manual Part 15-62, for correct U-joint phasing procedure.

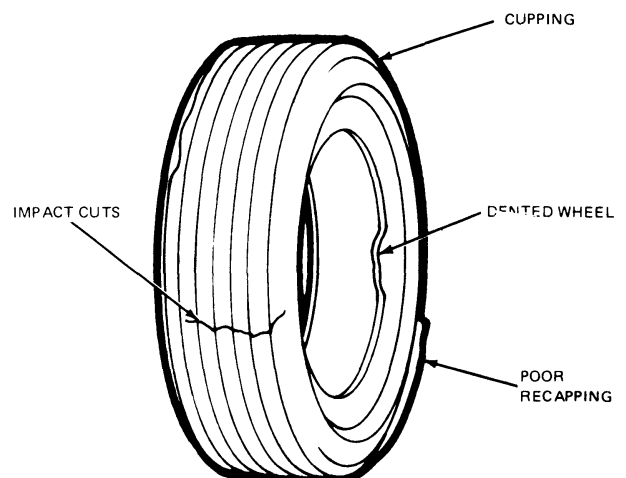
INSPECT FUEL TANK MOUNTING BRACKETS AND STRAPS (50 GALLON AND UP)—TIGHTEN AS REQUIRED (B-SERIES ONLY)

Inspect the fuel tank mounting brackets and straps to be sure the fuel tanks are securely attached to the vehicle.

CHECK AND CORRECT RUNOUT (CAST SPOKE WHEELS) B-SERIES ONLY

Trueness or runout can vary in two dimensions. Radial runout is the variation in trueness around the circumference around a wheel or tire. Lateral runout is the variation in trueness in a side to side direction.

Before checking runout, inspect the wheels and tires for impact cuts, cupping, and poor recapping or bent wheels or rims (Fig. 5). If damage is severe, replace the tire, wheel, or both. Also check wheel bearing endplay which should be between 0.001 and 0.010 inch both front and rear.



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FIG. 5 Wheel and Rim Inspection

To check runout on cast wheels, first tighten the wheel nut clamp nuts to specification found at the end

of this part, then, using a Rotunda Tire Runout Gauge (19-0001) or equivalent, check the lateral and radial runout for the rims and tires (Fig. 6).

If the lateral runout is over 0.070 inch, loosen the wheel clamp nuts and retighten them in steps (Fig. 7) to the specified torque while using the runout gauge as a guide. The nuts should be tightened in increments of 10, 50, 100, 150 and 200 ft-lbs.

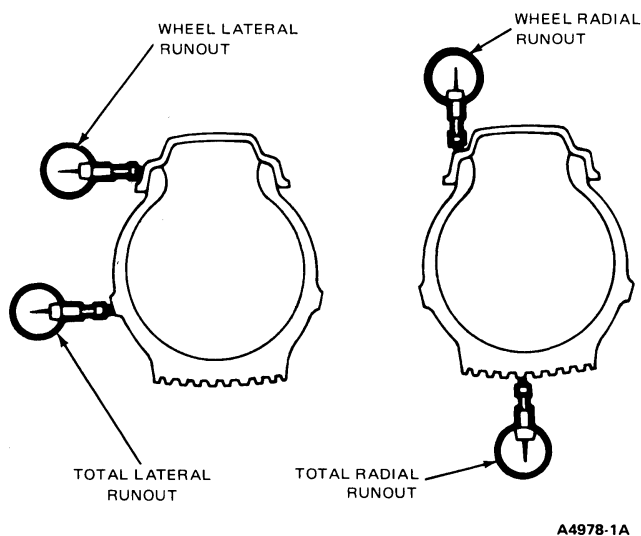


FIG. 6 Checking Lateral and Radial Runout

If proper lateral runout still cannot be obtained, remove the wheel and clean off the rim mounting surfaces, wheel, and spider to remove dirt, rust, paint, and other foreign matter. Then remount and retighten the wheel as before.

Check the radial runout (Fig. 8). If it is greater than 0.070 inch, again loosen and tighten the clamp nuts using the gauge as a guide to check both lateral and radial runout between the tightening steps. Always minimize radial runout before truing tires. If radial runout still exceeds 0.070 inch, remove and reposition the tire and rim to minimize the radial and lateral runout.

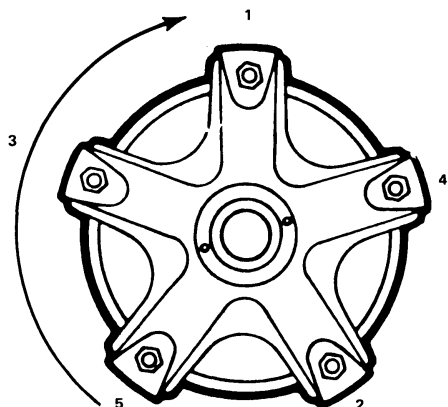


FIG. 7 Wheel Clamp Nut Tightening Sequence

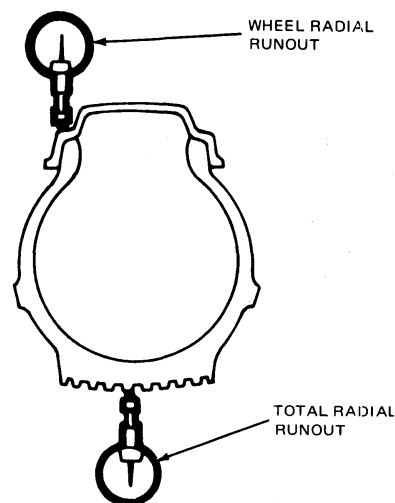


FIG. 8 Checking Radial Runout

Whenever it is necessary to remove and remount the tire to minimize lateral and radial, be sure to use a generous amount of tire soap, so that the tire will assume a natural position on the rim. A dry mounted tire can take an unnatural set when inflated. It is a good practice to drive the truck around the block to sort the tires.

For dual tire wheel assemblies which exceed 0.070 inch radial runout at or near the same point, loosen the outer tire and rim and rotate it until the high point of the assembly is opposite the high point of the inner tire and rim assembly (Fig. 9). Then, again check radial runout and loosen and tighten the nuts in steps, if necessary.

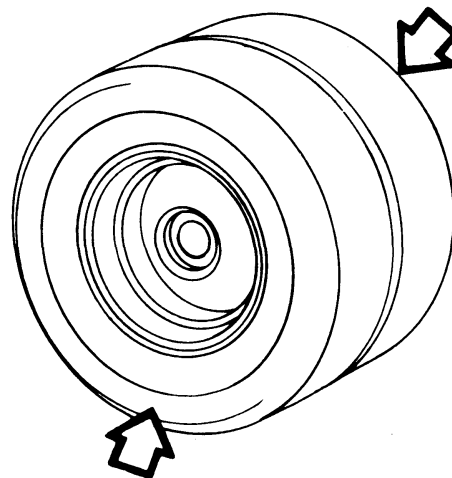


FIG. 9 Correcting Dual Tire Wheel Radial Runout

If the tire cannot be brought into round using the previous procedures, it will have to be trued using a special machine such as the Amermac tire truer or equivalent. This machine actually removes rubber from the tire, while it is mounted on the truck, to bring it back into round. Of course, if some badly distorted or damaged tires cannot be trued, they will have to be replaced.

MAINTENANCE

The scheduled and non-scheduled maintenance recommendations are included in this Part for reference. The emission systems required maintenance services and the vehicle maintenance services are separated. Emission system required maintenance is not covered in this part and is covered in Part 50-29 of this volume. Be sure to perform all maintenance services by referring to both parts of the schedule.

It should be noted, however, that any modification of the emission control systems could create liability under Federal law (U.S.) if made prior the first sale and registration, and under the laws of some states, if made thereafter. Further, federal law prohibits vehicle manufacturers or dealer and other persons engaged in the business of repairing, servicing, selling, leasing, or trading motor vehicles as well as fleet operations from knowingly removing or rendering an emission control system inoperative after sale and delivery to an ultimate purchaser. In Canada, modifications of the emission control system could create liability under applicable Federal or Provincial laws.

MAINTENANCE SCHEDULE APPLICABLE TO BRONCO, E-100, E-150, E-250, E-350 AND F-100, F-150, F-250, F-350 TRUCKS

Three maintenance schedules are specified for the 1980 model Bronco, Econoline, and F series trucks. They are identified by the letters B, E, and L, as follows:

BRONCO

The "B" maintenance schedule is required for all unleaded fuel engines (All U.S. Vehicles).

The "L" maintenance schedule is required for all Canadian leaded fuel vehicles with 5.0L (302 C.I.D.) engines.

The "E" maintenance schedule is required for all other Canadian leaded fuel engines.

Econoline—E-100 Thru E-350

E-100 Vehicles Only

All E-100 vehicles have the "B" maintenance schedule.

E-150 and E-250 Vehicles

All E-150 and E-250 vehicles sold in the U.S. have the "B" maintenance schedule, except 11/12 Passenger Club Wagon. Canadian E-150 and E-250 vehicles have the "E" maintenance schedule, except those with the 5.0L (302 CID) engine.

E-350 Vehicles and E-250 11/12 Passenger Club Wagons (U.S.)

All E-350 vehicles, regardless of the engine size, and E-250 11/12 Passenger Club Wagons (U.S.), have the "E" maintenance schedule.

NOTE: Canadian leaded fuel E-150/250 vehicles with 5.0L (302 CID) engines use the "L" schedule.

F-SERIES—F-100 THRU F-350

F-100 Vehicles Only

All F-100 vehicles have the "B" maintenance schedule.

F-150 and F-250 Vehicles

All F-150 and F-250 vehicles sold in the U.S. have the "B" maintenance schedule.

Canadian F-150 and F-250 vehicles with leaded fuel engines have the "E" maintenance schedule except for the 5.0L (302 C.I.D.) engine which uses the "L" schedule.

F-350 Vehicles Only

All F-350 vehicles, regardless of engine size, have the "E" maintenance schedule.

MAINTENANCE SCHEDULE APPLICABLE TO MEDIUM DUTY AND HEAVY DUTY TRUCKS OVER 8,500 POUNDS GVW

Two emissions system maintenance schedules, E and P, are applicable to 1980 model year Medium Duty Trucks and Heavy Trucks over 8,500 pounds GVW. The Maintenance Schedule "E" applies to trucks equipped with the 6.1L (370 CID), 6.6L (400 CID), or 7.0L (429 CID), engines. Maintenance schedule "P" applies to trucks equipped with the 7.8 (477 CID), or 8.8L (534 CID) engines.

NOTE—1980 vehicles built after January 1, 1980 will be equipped with engines which have been certified as complying with 1980 Emission standards. Certain 1980 vehicles built prior to that date may be equipped with engines which have been certified as complying with 1979 Emission standards. In either case, the maintenance schedules contained herein must be used to maintain your engine.

Effective January 1, 1978, federal regulations became effective governing the noise emissions on trucks over 10,000 lbs. GVWR. The following statements concerning prohibited tampering acts and maintenance, and the noise warranty found in the Warranty Facts Booklet, are applicable to completed Econoline Cutaways and Half-Cabs over 10,000 lbs. GVWR.

Federal law prohibits the following acts or the causing thereof:

- (1) the removal or rendering inoperative by any person other than for purposes of maintenance, repair or replacement of any device or element of design incorporated into any new vehicle for the purpose of noise control prior to its sale or delivery to the ultimate purchaser or while it is in use, or
- (2) the use of the vehicle after such device or element of design has been removed or rendered inoperative by any person.

Among those following acts presumed to constitute tampering are the acts listed below:

Engine Air Induction System: removal of the air duct, air cleaner and/or air cleaner element.

Exhaust System: Removal or rendering inoperative exhaust system components including the muffler, outlet pipe, resonator or diffuser.

Engine Cooling System: removal of the fan shroud. Removal or rendering inoperative of the fan clutch.

Acoustical Shielding:

Removal of noise shields or acoustical absorptive material.

Engine:

Removal or rendering engine speed governor inoperative so as to allow engine speed to exceed manufacturer specifications.

Removal of engine mounted noise shields or oil pan enclosure.

NON-EMISSION SYSTEMS REQUIRED MAINTENANCE**E-100/150/250 (Except E-100/150 with 4.9L [300 CID] Engine)****BRONCO — ALL U.S. VEHICLES WITH UNLEADED FUEL ENGINES****F-100/150 Except 4.9L (300 CID); F-250; F-150 4x4 4.9L (300 CID)****Maintenance Schedule B**

MAINTENANCE SCHEDULE B MAINTENANCE OPERATION	SERVICE INTERVAL Time in months or miles (or kilometers) in thousands, whichever occurs first, unless otherwise specified. Note — Scheduled maintenance beyond 50,000 miles (80,000 km.) should be continued at the same intervals as before except as noted.							
	MONTHS	7.5	15	22.5	30	37.5	45	52.5
MILES		7.5	15	22.5	30	37.5	45	52.5
KILOMETERS		12	24	36	48	60	72	84
Other Systems								
Lubricate slip yoke grease fitting ② ③		B	B	B	B	B	B	B
Lubricate front axle spindle pins ② ③		B	B	B	B	B	B	B
Lubricate steering linkage ② ③		B	B	B	B	B	B	B
Inspect front wheel bearing lubrication. On Bronco and F-Series (4x4) also inspect spindle needle bearing lubrication ② ③ ④ ⑤ ⑦					B			
Clean and re-lubricate free running hubs (4x4) (Bronco and F-Series only) ① ②					B			
Inspect disc brake linings, rotors, piston boots and caliper retainers and clean and lubricate caliper slide rails ③ ④ ⑤ ⑦					B			
Inspect drum brake linings, brake lines and hoses ③ ⑥					B			
Inspect and lubricate clutch linkage ⑤		B	B	B	B	B	B	B
Inspect the exhaust system including the heat and brush shields and all exhaust system fasteners ③ ⑦					B			
Adjust automatic transmission bands ⑥		B		B			B	
Drain and refill automatic transmission ⑥				B			B	
Check brake master cylinder fluid level Repack and adjust rear wheel bearings (Dana axles only) ② ③ ④					B			
Check and adjust wheel lug nut torque to the torque specified ⑨		B	B	B	B	B	B	B

NOTES:

- ① More often if operated in severe dust conditions.
- ② Perform each 1,000 miles (1,600 kilometers) in off-highway operation.
- ③ Perform daily when operating in mud and/or water.
- ④ Replace wheel seal, axle shaft bolts, lockwashers, and axle shaft gasket whenever a hub assembly is removed.
- ⑤ Adjust, service or replace as required.
- ⑥ More frequent intervals may be required under adverse operating conditions.
- ⑦ Remove accumulated debris and inspect shields and attachments. Perform each 3,000 miles (4,800 kilometers) for severe service usage over unpaved roads or off-road applications.
- ⑧ Severe Service Operation: The automatic transmission is considered operating under severe service conditions when vehicle is not equipped with an auxiliary cooler and in fleet usage, or accumulates 2,000 miles (3,219 kilometers) or more per month.
NOTE: After 45,000 miles (72,000 kilometers) continue to adjust bands and drain and refill transmission at each 22,500 mile (36,000 kilometer) interval.
- ⑨ Perform initial check and adjustment at 500 miles (800 km). Perform succeeding checks and adjustments at the intervals shown.

INSPECT means a visual observation of a system.

CHECK means a functional measurement of a system's operation (performance) — correct as required.

NON-EMISSION SYSTEMS REQUIRED MAINTENANCE**E-100/150 4.9L (300 CID) Only****F-100/150 4.9L (300 CID) Only Except F-150 4x4****Maintenance Schedule B**

MAINTENANCE SCHEDULE B MAINTENANCE OPERATION	SERVICE INTERVAL Time in months or miles (or kilometers) in thousands, whichever occurs first, unless otherwise specified. Note — Scheduled maintenance beyond 50,000 miles (80,000 km.) should be continued at the same intervals as before except as noted.					
	5	10	20	30	40	50
MONTHS	5	10	20	30	40	50
MILES	5	10	20	30	40	50
KILOMETERS	8	16	32	48	64	80
Other Systems						
Inspect exhaust system including heat and brush shields and all exhaust system fasteners ① ②				B		
Lubricate slip yoke grease fitting ③ ④		B	B	B	B	B
Lubricate front axle spindle pins ③ ④		B	B	B	B	B
Inspect and lubricate clutch linkage ②		B	B	B	B	B
Inspect drum brake linings, brake lines and hoses ② ③				B		
Inspect front wheel bearing lubrication. On F-Series (4x4) also inspect spindle needle bearing lubrication ② ③ ④				B		
Inspect disc brake linings, rotors, piston boots, and caliper retainers and clean and lubricate caliper slide rails ① ② ③ ④				B		
Lubricate steering linkage ③ ④		B	B	B	B	B
Check brake master cylinder fluid level				B		
Adjust automatic transmission bands ⑥		B		B		B
Drain and refill automatic transmission ⑥			B		B	
Check and adjust wheel lug nut torque to the torque specified ⑦		B	B	B	B	B

NOTES:

- ① Remove accumulated debris and inspect shields and attachments. Perform each 5,000 miles (8,000 kilometers) for severe service usage over unpaved roads or off-road applications.
- ② Adjust, service or replace as required.
- ③ Perform each 1,000 miles (1,600 kilometers) in off-highway operation.
- ④ Perform daily when operating in mud and/or water.
- ⑤ More frequent intervals may be required under adverse operating conditions.
- ⑥ Severe Service Operation: The automatic transmission is considered operating under severe service conditions when vehicle is not equipped with an auxiliary cooler and in fleet usage, or accumulates 2,000 miles (3,219 kilometers) or more per month.
NOTE: After 50,000 miles (80,000 kilometers) continue to adjust bands and drain and refill transmission at each 20,000 mile (36,000 kilometer) interval.
- ⑦ Perform initial check and adjustment at 500 miles (800 kilometers). (100 and 500 miles for vehicles equipped with dual rear wheels.) Perform succeeding checks and adjustments at the intervals shown.

INSPECT means a visual observation of a system.

CHECK means a functional measurement of a system's operation (performance) — correct as required.

NON-EMISSION SYSTEMS REQUIRED MAINTENANCE**Bronco, Econoline, F-Series (Light Truck)****Maintenance Schedule E****Leaded Fuel Engines Except Canadian 5.0L (302 CID)**

MAINTENANCE OPERATION	SERVICE INTERVAL Time in months or miles (or kilometers) in thousands, whichever occurs first, unless otherwise specified. Note — Scheduled maintenance beyond 50,000 miles (80,000 km) should be continued at the same intervals as before except as noted.									
	5	10	15	20	25	30	35	40	45	50
	5	10	15	20	25	30	35	40	45	50
	8	16	24	32	40	48	56	64	72	80
MONTHS										
MILES										
KILOMETERS										
Other Systems										
Lubricate slip yoke grease fitting ① ②	E	E	E	E	E	E	E	E	E	E
Lubricate front axle spindle pins ① ②	E	E	E	E	E	E	E	E	E	E
Inspect and lubricate clutch linkage ②	E	E	E	E	E	E	E	E	E	E
Inspect entire exhaust system (including inlet pipe, muffler, outlet pipe, heat and brush shields, resonator, diffuser and all exhaust clamps and fasteners) for holes, leakage, breakage, looseness, and corrosive damage ④ ⑥ ⑧						E				
Check brake master cylinder fluid level						E				
Inspect disc brake linings, rotors, piston boots and caliper retainers and clean and lubricate caliper slide rails ② ④ ⑤ ⑥						E				
Inspect drum brake linings, lines, and hoses ④ ⑤						E				
Inspect front wheel bearing lubrication (on Bronco and F-Series (4x4) also inspect spindle needle bearing lubrication.) ① ② ④						E				
Repack and adjust rear wheel bearings (Dana axles only) ① ② ③						E				
Adjust automatic transmission bands ①	E			E			E			
Drain and refill automatic transmission ②				E			E			
Lubricate steering linkage ① ②	E	E	E	E	E	E	E	E	E	E
Inspect engine air induction system (including air duct, air cleaner, and air cleaner element) for loose fitting, damaged or missing components. (E-350 and F-350 over 10,000 lbs. GVWR only) ④ ⑥						E				
Inspect the fan and fan shroud for damage (E-350 and F-350 over 10,000 lbs. GVWR only) ④ ⑤			E			E			E	
Check and adjust wheel lug nut torque to the torque specified ②	E	E	E	E	E	E	E	E	E	E
Clean and repack free running hubs (4x4 only) (Bronco and F-Series) ① ②						E				

NOTES:

- ① Perform each 1,000 miles (1,600 kilometers) in off-highway operation.
- ② Perform daily when operating in mud and/or water.
- ③ Replace wheel seal, hub gasket, hub bolts, and lockwashers whenever a hub assembly is removed.
- ④ Adjust, service, or replace as required.
- ⑤ More frequent intervals may be required under adverse operating conditions.
- ⑥ Remove accumulated debris and inspect shields and attachments. **Perform each 3,000 miles (4,800 kilometers) for severe usage over unpaved roads or off-road applications.**
- ⑦ Severe Service Operation: The automatic transmission is considered operating under severe service conditions when vehicle is not equipped with an auxiliary cooler and in fleet usage, or accumulates 2,000 miles (3,219 kilometers) or more per month.
NOTE: After 35,000 miles (56,000 kilometers) continue to adjust bands and drain and refill transmission at each 15,000 mile (24,000 kilometer) interval.
- ⑧ Also a noise emission control service (E-350 over 10,000# GVWR only).
- ⑨ Perform initial check and adjustment at 500 miles (800 kilometers); 100 and 500 miles (160 and 800 kilometers) for vehicles equipped with dual rear wheels. Perform succeeding checks and adjustments at the intervals shown.

INSPECT means a visual observation of a system.

CHECK means a functional measurement of a system's operation (performance) — correct as required.

NON-EMISSION SYSTEMS REQUIRED MAINTENANCE**Bronco, Econoline, F-Series (Light Truck)****Maintenance Schedule L****(Canadian Leaded Fuel Vehicles With 5.0L [302 CID] Engines Only)**

MAINTENANCE OPERATION	SERVICE INTERVAL											
	Time in months or miles (or kilometers) in thousands, whichever occurs first, unless otherwise specified. Note — Scheduled maintenance beyond 50,000 miles (80,000 km) should be continued at the same intervals as before except as noted.											
MONTHS	6	12	15	18	24	30	36	42	45	48		
MILES	6	12	15	18	24	30	36	42	45	48		
KILOMETERS	9.6	19.2	24	28.8	38.4	48	57.6	67.2	72	76.8		
Other Systems												
Lubricate slip yoke grease fitting ① ②	L	L		L	L	L	L	L		L		
Lubricate front axle spindle pins ① ②	L	L		L	L	L	L	L		L		
Inspect and lubricate clutch linkage ④	L	L		L	L	L	L	L		L		
Inspect entire exhaust system (including inlet pipe, muffler, outlet pipe, heat and brush shields, resonator, diffuser and all exhaust system clamps and fasteners) for holes, leakage, breakage, looseness, and corrosive damage ④ ⑥							L					
Check brake master cylinder fluid level						L						
Inspect disc brake linings, rotors, piston boots and caliper retainers and clean and lubricate caliper slide rails ② ④ ⑤ ⑥						L						
Inspect drum brake linings, lines, and hoses ④ ⑤						L						
Inspect front wheel bearing lubrication (on Bronco and F-Series (4x4), also inspect spindle needle bearing lubrication) ① ② ③ ④						L						
Repack and adjust rear wheel bearings (Dana axles only) ① ② ③						L						
Adjust automatic transmission bands ⑦	L			L			L					
Drain and Refill automatic transmission ⑦				L			L					
Lubricate steering linkage ① ②	L	L		L	L	L	L	L		L		
Check and adjust wheel lug nut torque to the torque specified ⑧	L	L		L	L	L	L	L		L		
Clean and repack free running hubs (4x4 only) Bronco and F-Series ① ②						L						

NOTES:

- ① Perform each 1,000 miles (1,600 kilometers) in off-highway operation.
- ② Perform daily when operating in mud and/or water.
- ③ Replace wheel seal, hub gasket, hub bolts, and lockwashers whenever a hub assembly is removed.
- ④ Adjust, service, or replace as required.
- ⑤ **More frequent intervals may be required under adverse operating conditions.**
- ⑥ Remove accumulated debris and inspect shields and attachments. **Perform each 3,000 miles (4,800 kilometers) for severe usage over unpaved roads or off-road applications.**
- ⑦ Drain and refill automatic transmission fluid at 18,000 and 36,000 miles (28,800 and 57,600 kilometers) for severe and/or continuous and fleet usage only. NOTE: After 36,000 miles (57,600 kilometers), continue to adjust bands at each 18,000 mile (28,800 kilometer) interval.
- ⑧ Perform initial check and adjustment at 500 miles (800 kilometers): 100 and 500 miles (160 and 800 kilometers) for vehicles equipped with dual rear wheels. Perform succeeding checks and adjustments at the intervals shown.

INSPECT means a visual observation of a system.

CHECK means a functional measurement of a system's operation (performance) — correct as required.

NON-EMISSION SYSTEMS REQUIRED MAINTENANCE**600-700 and 7000 Series
Maintenance Schedule E**

FOR ENGINE SIZES 6.1L (370 CID), 6.6L (400 CID), 7.0L (429 CID)	SERVICE INTERVAL										
	Time in months or miles (or kilometers) in thousands, whichever occurs first, unless otherwise specified.										
	Note — Scheduled maintenance beyond 50,000 miles (80,000 km) should be continued at the same intervals as before except as noted.										
MONTHS	5	10	15	20	25	30	35	40	45	50	
MILES	5	10	15	20	25	30	35	40	45	50	
KILOMETERS	8	16	24	32	40	48	56	64	72	80	
Engine System											
Torque engine mounting bolts	④									E	
Check/adjust radiator shutter assembly for proper operation ② ③			E			E			E		
Inspect engine air induction system (including air duct and air cleaner) for loose fitting, damaged, or missing components ① ②			E			E			E		
Check diesel engine fuel control system (including governor) for abnormal engine performance ②	SEE NOTE ⑫										
Inspect diesel engine mounted noise hardware for damage or oil/fuel saturation, i.e. block panels, oil pan covers, treated valve covers ① ②	ANNUALLY										
Inspect fan and fan shroud for damage ①						E					
Inspect fan clutch and/or water pump for bearing wear and/or leakage						E					
Chassis & Body Mounted Noise Shields — Side Shields, Rear Shields, Undershields, Hood Blankets ③											
Inspect for damage to absorber, replace when necessary ① ②			E						E		
Exhaust System											
Inspect entire exhaust system (inlet pipes, mufflers, outlet pipes, clamps and fasteners) for holes, leakage, breakage, corrosive damage, and separation from other components ① ②			E			E			E		
Frame and Mounting System											
Torque all crossmember bolts										E	
Suspension System											
Torque wheel mounting nuts	SEE NOTE ⑤										
Lube front and rear spring shackle and pins ⑥			E			E			E		
Torque front and rear spring U-bolts	④		E			E			E		
Torque front and rear spring bracket to frame bolts									E		

NON-EMISSION SYSTEMS REQUIRED MAINTENANCE (Cont'd.)

600-700 and 7000 Series

Maintenance Schedule E (Cont'd.)

FOR ENGINE SIZES 6.1L (370 CID), 6.6L (400 CID), 7.0L (429 CID)	SERVICE INTERVAL									
	Time in months or miles (or kilometers) in thousands, whichever occurs first, unless otherwise specified. Note — Scheduled maintenance beyond 50,000 miles (80,000 km) should be continued at the same intervals as before except as noted.									
MONTHS	5	10	15	20	25	30	35	40	45	50
MILES	5	10	15	20	25	30	35	40	45	50
KILOMETERS	8	16	24	32	40	48	56	64	72	80
Driveline System										
Drain and refill rear axle	⑦								E	
Check rear axle lube level, clean breather and magnetic drain plug			E			E			E	
Lube U-joints, slip yoke and center support bearing when equipped with grease fittings			E			E			E	
Check two-speed axle electric shift unit lube level ⑥			E			E			E	
Brake System										
Drain air brake system reservoir — manual valve	DAILY									
Check air brake system reservoir automatic valve operation	WEEKLY									
Torque air compressor mounting bolts	④								E	
Check operation of air reservoir safety valve		E		E		E		E		E
Lube air brake foot control valve, valve treadle hinge and roller brake camshaft ⑧					E					E
Clean or replace air filter-MGM Stopguard brake chamber ⑧									E	
Inspect brake lines and linings, disc brake shoes, linings and piston boots, compressor to air tank tubing, and torque backing plate bolts ⑪ ⑬			E			E			E	
Replace brake chamber diaphragm ⑤ ⑨									E	
Clean frame mounted booster air cleaner ⑥			E			E			E	
Lube parking brake cable, linkage, pivots and clevises			E			E			E	
Check anti-lock modulator valve for operation and air leakage			E			E			E	
Check brake and C-Series clutch master cylinder fluid level			E			E			E	
Lube brake pedal pivot and linkage						E				
Disassemble, clean and check air reservoir safety valve	EACH 100,000 MILES/160,000 KILOMETERS									
Disassemble, clean and check quick release valve ⑤									E	
Disassemble, clean and check DV-2 automatic drain valve ⑥									E	
Lube brake slack adjuster (manual and automatic) ⑥									E	
Lube brake camshaft (S cam air brakes) ⑧						E				
Adjust drum brakes ⑩		E		E		E		E		E

NON-EMISSION SYSTEMS REQUIRED MAINTENANCE (Cont'd.)

600-700 and 7000 Series

Maintenance Schedule E (Cont'd.)

FOR ENGINE SIZES 6.1L (370 CID), 6.6L (400 CID), 7.0L (429 CID)	SERVICE INTERVAL										
	Time in months or miles (or kilometers) in thousands, whichever occurs first, unless otherwise specified. Note — Scheduled maintenance beyond 50,000 miles (80,000 km) should be continued at the same intervals as before except as noted.										
MAINTENANCE OPERATION											
MONTHS	5	10	15	20	25	30	35	40	45	50	
MILES	5	10	15	20	25	30	35	40	45	50	
KILOMETERS	8	16	24	32	40	48	56	64	72	80	
Transmission System											
Check manual transmission fluid level and clean breather ⑥			E			E			E		
Lube transmission remote shift rod bearings, front linkage cross shaft tube and crank (C-Series)			E			E			E		
Lube transmission control linkage pivots, clevises and U-joints						E					
Change lubricant in manual shift main or auxiliary trans. ⑨	⑧								E		
Torque trans. front mounting bolts and rear retainer bolts and nuts	⑧								E		
Drain and refill automatic transmission fluid (severe service only) ⑬						E					
Clutch System											
Lube clutch linkage, pivots and clevises ⑧			E			E			E		
Lube clutch equalizer, idler lever and cross shaft and all linkages			E			E			E		
Lube check release bearing and hub ⑧						E					
Fuel Systems											
Inspect accelerator ball joints (rod assemblies)			E			E			E		
Inspect accelerator pivot shaft assemblies			E			E			E		
Torque fuel tank support mounting bolts									E		
Drain accumulated water or sediment from fuel tanks ⑩			E			E			E		

NON-EMISSION SYSTEMS REQUIRED MAINTENANCE**600-700 and 7000 Series****Maintenance Schedule E**

FOR ENGINE SIZES 6.1L (370 CID), 6.6L (400 CID), 7.0L (429 CID)	SERVICE INTERVAL										
	Time in months or miles (or kilometers) in thousands, whichever occurs first, unless otherwise specified. Note — Scheduled maintenance beyond 50,000 miles (80,000 km) should be continued at the same intervals as before except as noted.										
MAINTENANCE OPERATION	MONTHS	5	10	15	20	25	30	35	40	45	50
	MILES	5	10	15	20	25	30	35	40	45	50
	KILOMETERS	8	16	24	32	40	48	56	64	72	80
Steering System											
Check manual steering gear lubricant level ④										E	
Check power steering pump fluid level ④			E				E			E	
Lube steering column U-joints when equipped with grease fittings ④							E				
Torque check power steering pump mounting bracket bolts ④										E	
Lube steering linkage when equipped with grease fittings ④							E				
Lube front axle spindle pins ④			E				E			E	
Repack and adjust front wheel bearings ⑨										E	
Drain oil, adjust bearings, and refill with axle lubricant — Stemco wheel seals										E	
Torque steering input shaft fasteners "F" and "B" series ④										E	
Torque front axle spindle taper pin nuts ⑭		REQUIRED AT FIRST 500 MILES ONLY									

NOTES:

- ① Adjust, repair or replace as required with same or equivalent part.
- ② Also a noise emission control service.
- ③ If so equipped.
- ④ Required at this interval for initial service only. Thereafter, perform only at major intervals as indicated in the schedule.
- ⑤ Required at first 500 and 1,000 miles (800 and 1,600 kilometers) and at 500 and 1,000 miles (800 and 1,600 kilometers) after each wheel removal.
- ⑥ Perform at specified miles/kilometers or 6 months, whichever occurs first.
- ⑦ Drain and refill rear axle first 500-1,000 miles (800-1,600 kilometers).
- ⑧ Perform at specified miles/kilometers or 12 months, whichever occurs first.
- ⑨ Perform at specified miles/kilometers or 18 months, whichever occurs first.
- ⑩ More frequent intervals may be required under adverse operating conditions.
- ⑪ Replace wheel seal whenever a hub assembly is removed.
- ⑫ See the diesel engine Manufacturer's Service Policy or Operator's Manual for service requirements, intervals, performance specifications and adjustments.
- ⑬ Adjust anti-lock wheel speed sensor position if break drum is removed.
- ⑭ All axles except 9000 lb. hydraulic C and L-Series.

- ⑮ **SEVERE SERVICE OPERATION: WHEN OPERATING YOUR VEHICLE UNDER ANY OF THE FOLLOWING CONDITIONS, CHANGE ENGINE OIL EVERY 3 MONTHS OR 3,000 MILES (4,800 KILOMETERS), WHICHEVER OCCURS FIRST, AND REPLACE OIL FILTER AT ALTERNATE OIL CHANGES. CLEAN, CHECK AND REGAP SPARK PLUGS EVERY 6,000 MILES (9,600 KILOMETERS).**
 - EXTENDED PERIODS OF IDLING OR LOW SPEED OPERATION SUCH AS DOOR-TO-DOOR DELIVERY.
 - OPERATION WHEN OUTSIDE TEMPERATURE REMAINS BELOW +10°F (-12°C) FOR 60 DAYS OR MORE AND MOST TRIPS ARE LESS THAN 10 MILES (16 KILOMETERS).
 - OPERATION IN SEVERE DUST CONDITIONS.
 - EXTENDED PERIODS OF HIGH SPEED OPERATION WITH FULLY LOADED VEHICLE (MAXIMUM G.V.W.).

INSPECT means a visual observation of a system.

CHECK means a functional measurement of a system's operation (performance) — correct as required.

NON-EMISSION SYSTEMS REQUIRED MAINTENANCE**800-900, 8000-9000 Series****Maintenance Schedule E**

FOR ENGINE SIZES 6.1L (370 CID), 7.0L (429 CID) MAINTENANCE OPERATION	SERVICE INTERVAL Time in months or miles (or kilometers) in thousands, whichever occurs first, unless otherwise specified. Note — Scheduled maintenance beyond 50,000 miles (80,000 km) should be continued at the same intervals as before except as noted.										
	MONTHS	5	10	15	20	25	30	35	40	45	50
	MILES	5	10	15	20	25	30	35	40	45	50
	KILOMETERS	8	16	24	32	40	48	56	64	72	80
Engine System											
Inspect engine air induction system (including air duct and air cleaner) for loosefitting, damaged, or missing components ① ④											
Check/adjust radiator shutter assembly for proper operation ② ③											
Inspect fan and fan shroud for damage ①											
Inspect fan clutch and/or water pump for bearing wear and fluid leakage											
Torque engine mounting bolts	⑥										
Torque air stack mounting bolts and tighten clamps											
Replace diesel engine spin-on water filter											
Check maximum gasoline engine rpm (when equipped with electronic governor) against the following levels. Replace electronic module if engine rpm exceeds the limit ④											
ENGINE 6.1L (370 CID) 7.0L (429 CID)	MAXIMUM RPM 3600 4000										
Check diesel engine fuel control system (including governor) for abnormal engine performance ②	SEE NOTE 14										
Inspect diesel engine mounted noise hardware for damage or oil/fuel saturation i.e. block panels, oil pan covers, treated valve covers ③ ④	ANNUALLY										
Chassis & Body Mounted Noise Shields — Side Shields, Rear Shields, Undershields, Hood Blanket ①											
Inspect for damage to absorber. Replace when necessary ③ ④											
Exhaust System											
Inspect entire exhaust system (inlet pipes, mufflers, outlet pipes, clamps, and fasteners) for holes, leakage, breakage, corrosive damage, and separation from other components ① ④											

NON-EMISSION SYSTEMS REQUIRED MAINTENANCE (Cont'd.)

800-900, 8000-9000 Series

Maintenance Schedule E (Cont'd.)

FOR ENGINE SIZES 6.1L (370 CID), 7.0L (429 CID) MAINTENANCE OPERATION	SERVICE INTERVAL Time in months or miles (or kilometers) in thousands, whichever occurs first, unless otherwise specified. Note — Scheduled maintenance beyond 50,000 miles (80,000 km) should be continued at the same intervals as before except as noted.										
	MONTHS	5	10	15	20	25	30	35	40	45	50
	MILES	5	10	15	20	25	30	35	40	45	50
	KILOMETERS	8	16	24	32	40	48	56	64	72	80
Frame and Mounting System											
Torque all crossmember bolts										E	
Lube locking cams and lock handle linkage (C-Series)				E			E			E	
Suspension System											
Torque wheel mounting nuts	SEE NOTE ⑦										
Lube front and rear spring shackles and pins ⑧				E			E			E	
Torque front and rear spring U-bolts	⑥			E			E			E	
Torque front and rear spring bracket to frame bolts										E	
Lube rear torque rods on 50,000 lb. tandem axle and 44,000, 58,000 and 65,000 pound top drive axles ⑧				E			E			E	
Torque shock absorber bracket to frame bolts	EACH 100,000 MILES/ 160,000 KILOMETERS										
Lube Hendrickson suspension bronze bushings ⑧			E				E		E		E
Torque tandem axle walking beam adapter end nut, saddle cap nuts and torque arm attaching bolts or nuts	⑥										E
Torque Neway transverse beam nuts, axle adapters and equalizing beam pivot nuts	⑥										E
Driveline and Drive Axle Systems											
Drain and refill rear axle ②											E
Check rear axle lube level, clean breather and magnetic drain plug, and magnetic fill plug on Eaton forward tandem axle				E			E		E		E
Lube U-joints and slip yoke ③				E			E				E
Change oil filter and clean filter trap tandem axle power divider with oil pump											E
Check two-speed axle electric shift unit lube level ④				E			E				E
Check two-speed axle airshift motor vents and check lube level ⑤				E			E				E

NON-EMISSION SYSTEMS REQUIRED MAINTENANCE (Cont'd.)

800-900, 8000-9000 Series

Maintenance Schedule E (Cont'd.)

FOR ENGINE SIZES 6.1L (370 CID), 7.0L (429 CID) MAINTENANCE OPERATION	SERVICE INTERVAL Time in months or miles (or kilometers) in thousands, whichever occurs first, unless otherwise specified. Note — Scheduled maintenance beyond 50,000 miles (80,000 km) should be continued at the same intervals as before except as noted.										
	MONTHS	5	10	15	20	25	30	35	40	45	50
	MILES	5	10	15	20	25	30	35	40	45	50
	KILOMETERS	8	16	24	32	40	48	56	64	72	80
Brake System											
Torque air compressor mounting bolts ⑥										E	
Check operation of air reservoir safety valve			E				E			E	
Lube air brake foot control valve, valve treadle hinge and roller brake camshafts ⑦							E				
Clean or replace air filter-MGM stopguard brake chamber ⑧										E	
Inspect brake lines and linings; disc brake shoes, linings and piston boots; compressor to air tank tubing, and torque backing plate bolts ③			E				E			E	
Replace brake chamber diaphragm ⑨										E	
Disassemble, clean and check air reservoir safety valve	EACH 100,000 MILES/ 160,000 KILOMETERS										
Clean frame mounted booster air cleaner			E				E			E	
Lube parking brake cable, linkage, pivots, and clevises ④			E				E			E	
Check brake and C-Series clutch master cylinder fluid level ⑤			E				E			E	
Lube brake pedal pivot and linkage							E				
Adjust drum brakes ⑩	E		E				E			E	
Check air hydraulic intensifier fluid level			E				E			E	
Lube brake camshafts ⑦						E					E
Lube brake slack adjuster (manual and automatic) ⑥						E					E
Disassemble, check, and clean quick release valve ①	EACH 100,000 MILES/ 160,000 KILOMETERS										
Replace air hydraulic intensifier diaphragm ③										E	
Disassemble, check and lube air tank drain valve ⑤										E	
Check anti-lock modulator valve operation and air leakage			E				E			E	

NON-EMISSION SYSTEMS REQUIRED MAINTENANCE (Cont'd.)

800-900, 8000-9000 Series

Maintenance Schedule E (Cont'd.)

FOR ENGINE SIZES 6.1L (370 CID), 7.0L (429 CID) MAINTENANCE OPERATION	SERVICE INTERVAL Time in months or miles (or kilometers) in thousands, whichever occurs first, unless otherwise specified. Note — Scheduled maintenance beyond 50,000 miles (80,000 km) should be continued at the same intervals as before except as noted.									
	5	10	15	20	25	30	35	40	45	50
	5	10	15	20	25	30	35	40	45	50
	8	16	24	32	40	48	56	64	72	80
Transmission System										
Check manual transmission fluid level and clean breather			E			E			E	
Lube transmission remote shift rod bearings, front linkage cross shaft tube and crank (C-Series)			E			E			E	
Lube transmission control linkage pivots, clevises and U-joints						E				
Change lubricant in manual shift main or auxiliary transmission ⑩	⑩								E	
Drain or refill automatic transmission fluid (severe service only) ①						E				
Replace Fuller transmission air filter									E	
Clutch System										
Lube clutch linkage pivots and clevises ⑩						E				
Lube clutch equalizer, idler lever and cross shaft, and all linkages						E				
Lube clutch release bearing and hub ⑩						E				
Fuel System										
Inspect accelerator ball joints (rod assemblies)			E			E			E	
Inspect accelerator pivot shaft assemblies			E			E			E	
Torque check fuel tank support mounting bolts									E	
Replace one gallon fuel oil filter element										E
Drain accumulated water or sediment from fuel tank(s) ⑩			E			E			E	

NON-EMISSION SYSTEMS REQUIRED MAINTENANCE (Cont'd.)

800-900, 8000-9000 Series

Maintenance Schedule E (Cont'd.)

FOR ENGINE SIZES 6.1L (370 CID), 7.0L (429 CID) MAINTENANCE OPERATION	SERVICE INTERVAL Time in months or miles (or kilometers) in thousands, whichever occurs first, unless otherwise specified. Note — Scheduled maintenance beyond 50,000 miles (80,000 km) should be continued at the same intervals as before except as noted.									
	5	10	15	20	25	30	35	40	45	50
MONTHS	5	10	15	20	25	30	35	40	45	50
MILES	5	10	15	20	25	30	35	40	45	50
KILOMETERS	8	16	24	32	40	48	56	64	72	80
Steering System										
Check manual steering gear lubricant level ⑤	⑤								E	
Lube steering column U-joints when equipped with grease fittings	⑤					E				
Lube steering linkage when equipped with grease fittings	⑤					E				
Lube front axle spindle pins	⑤		E			E			E	
Repack and adjust front wheel bearings ⑩ ⑫									E	
Torque power steering pump mounting bracket bolts	⑤								E	
Check power steering pump fluid level	⑤		E			E			E	
Stemco wheel seals — drain oil, adjust bearings and refill with rear axle lubricant									E	
Check "L" series adjustable steering column for looseness. Adjust as required	⑤		E			E			E	
Torque front axle spindle taper pin nut ⑬	REQUIRED AT FIRST 500 MILES ONLY									

NOTES:

- ① **SEVERE SERVICE OPERATION: WHEN OPERATING YOUR VEHICLE UNDER ANY OF THE FOLLOWING CONDITIONS, CHANGE OIL EVERY 3 MONTHS OR 3,000 MILES (4,800 KILOMETERS), WHICHEVER OCCURS FIRST, AND REPLACE OIL FILTER AT ALTERNATE OIL CHANGES. CLEAN, CHECK AND REGAP SPARK PLUGS EVERY 6,000 MILES (9,600 KILOMETERS).**
- EXTENDED PERIODS OF IDLING OR LOW SPEED OPERATION SUCH AS DOOR-TO-DOOR DELIVERY.
 - OPERATION WHEN OUTSIDE TEMPERATURE REMAINS BELOW +10°F (−12°C) FOR 60 DAYS OR MORE AND MOST TRIPS ARE LESS THAN 10 MILES (16 KILOMETERS).
 - OPERATION IN SEVERE DUST CONDITIONS.
 - EXTENDED PERIODS OF HIGH SPEED OPERATION WITH FULLY LOADED VEHICLE (MAXIMUM G.V.W.).

② Drain and refill rear axle first 500/1000 miles.

③ Adjust, service or replace as required with same or equivalent part.

④ Also a noise emission control service.

⑤ If so equipped.

⑥ Required at this interval for initial service only. Thereafter, perform only at major intervals as indicated in the schedule.

⑦ Required at first 500 and 1,000 miles (800 and 1,600 kilometers) and at 500 and 1,000 miles (800 and 1,600 kilometers) after each wheel removal.

⑧ Perform at specified miles/kilometers or 6 months, whichever occurs first.

⑨ Perform at specified miles/kilometers or 12 months, whichever occurs first.

⑩ Perform at specified miles/kilometers or 18 months, whichever occurs first.

⑪ More frequent intervals may be required under adverse operating conditions.

⑫ Replace wheel seal whenever a hub assembly is removed.

⑬ Required each 50,000 miles (80,000 kilometers) for on-highway operation, at each 10,000 miles (16,000 kilometers) for off-road operation, and at each 5,000 miles (8,000 kilometers) for severe duty operation.

⑭ See the diesel engine Manufacturer's Service Policy or Operator's Manual for service requirements, intervals, performance specifications, and adjustments.

⑮ Adjust anti-lock wheel speed sensor position if brake drum is removed.

⑯ All axles except 9,000 lb. (hydraulic brakes) C and L-Series and 12,000 lb. (hydraulic brakes) "L" Series.

INSPECT means a visual observation of a system.

CHECK means a functional measurement of a system's operation (performance) — correct as required.

NON-EMISSION SYSTEMS REQUIRED MAINTENANCE**800-900, 8000-9000 Series****Maintenance Schedule P**

FOR ENGINE SIZE 7.8L (477 CID), 8.8L (534 CID)	SERVICE INTERVAL Time in months or miles (or kilometers) in thousands, whichever occurs first, unless otherwise specified. Note — Scheduled maintenance beyond 50,000 miles (80,000 km) should be continued at the same intervals as before except as noted.													
	MAINTENANCE OPERATION													
MONTHS	1	4	8	12	16	20	24	28	32	36	40	44	48	
MILES	1	4	8	12	16	20	24	28	32	36	40	44	48	
KILOMETERS	1.6	6.4	12.8	19.2	25.6	32.0	38.4	44.8	51.2	57.6	64.0	70.4	76.8	
Engine System														
Inspect engine air induction system (including air duct and air cleaner) for loosefitting, damaged, or missing components ② ④				P			P			P			P	
Check/adjust/lube radiator shutter assembly for proper operation ④ ⑩				P			P			P			P	
Inspect fan and fan shroud for damage ② ④							P						P	
Torque engine mounting bolts	⑥												P	
Torque air stack mounting bolts and tighten clamps				P			P			P			P	
Replace diesel engine spin-on water filter				P			P			P			P	
Check maximum gasoline engine rpm (when equipped with electronic governor) against the following levels. Replace electronic module if engine rpm exceeds the limit ③ ⑨					P				P				P	
ENGINE 7.8L (477 CID), 8.8L (534 CID)	MAXIMUM RPM 3200													
Check diesel engine fuel control system (including governor) for abnormal engine performance ③	SEE NOTE ⑫													
Inspect diesel engine mounted noise hardware for damage or oil/fuel saturation, i.e. block panels, oil pan covers, treated valve covers ② ④	ANNUALLY													
Chassis & Body Mounted Noise Shields —														
Side Shields, Rear Shields, Undershields, Hood Blank ①														
Inspect for damage to absorber. Replace when necessary ② ④ ⑨					P				P				P	
Exhaust System														
Inspect entire exhaust system (inlet pipes, mufflers, outlet pipes, clamps and fasteners) for holes, leakage, breakage, corrosive damage, and separation from other components ② ④ ⑨					P				P				P	
Frame and Mounting System														
Torque all crossmember bolts													P	
Lube locking cams and lock handle linkage (C-Series) ⑨							P						P	

See Notes on Page 50-02-44

NON-EMISSION SYSTEMS REQUIRED MAINTENANCE**800-900, 8000-9000 Series****Maintenance Schedule P (Cont'd.)**

FOR ENGINE SIZE 7.8L (477 CID), 8.8L (534 CID)	SERVICE INTERVAL Time in months or miles (or kilometers) in thousands, whichever occurs first, unless otherwise specified. Note — Scheduled maintenance beyond 50,000 miles (80,000 km) should be continued at the same intervals as before except as noted.														
	1	4	8	12	16	20	24	28	32	36	40	44	48		
MONTHS	1	4	8	12	16	20	24	28	32	36	40	44	48		
MILES	1	4	8	12	16	20	24	28	32	36	40	44	48		
KILOMETERS	1.6	6.4	12.8	19.2	25.6	32.0	38.4	44.8	51.2	57.6	64.0	70.4	76.8		
Suspension System															
Torque wheel mounting nuts	SEE NOTE ⑩														
Lube front and rear spring shackles and pins ⑨				P			P			P			P		
Torque front and rear spring U-bolts	⑥			P			P			P			P		
Torque front and rear spring bracket to frame bolts														P	
Lube rear torque rods on 50,000 lb. tandem axle and 44,000, 58,000 and 65,000 pound top drive axles ⑨							P							P	
Torque shock absorber bracket to frame bolts	EACH 100,000 MILES/160,000 KILOMETERS														
Lube Hendrickson suspension bronze bushings ⑨				P			P			P			P		
Torque tandem axle walking beam adapter end nut, saddle cap nuts and torque arm attaching bolts or nuts	⑥													P	
Torque Neway transverse beam nuts, axle adapters and equalizing beam pivot nuts	⑥													P	
Driveline and Drive Axle Systems															
Drain and refill rear axle ⑧	⑥									P					
Check rear axle lube level, clean breather and magnetic drain plug, and magnetic fill plug on Eaton forward tandem axle ⑧				P			P			P			P		
Lube U-joints and slip yoke ⑨ ⑪														P	
Check two-speed axle electric shift unit lube level ⑧				P			P			P			P		
Check two-speed axle airshift motor vents and check lube level ⑧				P			P			P			P		
Change oil filter or clean filter trap tandem axle power divider with oil pump														P	

NON-EMISSION SYSTEMS REQUIRED MAINTENANCE**800-900, 8000-9000 Series****Maintenance Schedule P (Cont'd.)**

FOR ENGINE SIZE 7.8L (477 CID), 8.8L (534 CID) MAINTENANCE OPERATION	SERVICE INTERVAL Time in months or miles (or kilometers) in thousands, whichever occurs first, unless otherwise specified. Note — Scheduled maintenance beyond 50,000 miles (80,000 km) should be continued at the same intervals as before except as noted.													
	MONTHS	1	4	8	12	16	20	24	28	32	36	40	44	48
	MILES	1	4	8	12	16	20	24	28	32	36	40	44	48
KILOMETERS	1.6	6.4	12.8	19.2	25.6	32.0	38.4	44.8	51.2	57.6	64.0	70.4	76.8	
Brake System														
Torque air compressor mounting bolts	Ⓒ													P
Check operation of air reservoir safety valve					P			P			P			P
Lube air brake foot control valve, valve treadle hinge and roller ⑨								P						P
Clean or replace air filter-MGM stopguard brake chamber ⑨														P
Inspect brake lines and linings; disc brake shoes, linings and piston boots; compressor to air tank tubing, and torque backing plate bolts								P						P
Replace brake chamber diaphragm ⑧														P
Disassemble, clean and check air reservoir safety valve ⑩	EACH 100,000 MILES/160,000 KILOMETERS													
Clean frame mounted booster air cleaner ⑨					P			P			P			P
Lube parking brake cable, linkage, pivots and clevises ⑧					P			P			P			P
Check brake and C-Series clutch master cylinder fluid level ⑧								P						P
Lube brake pedal pivot and linkage								P						P
Adjust drum brakes	P				P			P			P			P
Check air hydraulic intensifier fluid level					P			P			P			P
Disassemble, check, and clean quick release valve														P
Replace air hydraulic intensifier diaphragm ⑩														P
Disassemble, check and lube air tank drain valve ⑧														P
Check anti-lock modulator valve for operation and air leakage					P			P			P			P
Lube brake camshafts								P						P
Lube brake slack adjuster (manual and automatic)								P						P

NON-EMISSION SYSTEMS REQUIRED MAINTENANCE**800-900, 8000-9000 Series****Maintenance Schedule P (Cont'd.)**

FOR ENGINE SIZE 7.8L (477 CID), 8.8L (534 CID) MAINTENANCE OPERATION	SERVICE INTERVAL Time in months or miles (or kilometers) in thousands, whichever occurs first, unless otherwise specified. Note — Scheduled maintenance beyond 50,000 miles (80,000 km) should be continued at the same intervals as before except as noted.																
	MONTHS	1	4	8	12	16	20	24	28	32	36	40	44	48			
	MILES	1	4	8	12	16	20	24	28	32	36	40	44	48			
KILOMETERS	1.6	6.4	12.8	19.2	25.6	32.0	38.4	44.8	51.2	57.6	64.0	70.4	76.8				
Transmission System																	
Check manual transmission fluid level and clean breather ②				P			P			P				P			
Lube transmission remote shift rod bearings, front linkage cross shaft tube and crank (C-Series)				P			P			P				P			
Lube transmission control linkage pivots, clevises and U-joints ③							P							P			
Change lubricant in manual shift main or auxiliary transmission ④		⑥												P			
Drain or refill automatic transmission fluid (severe service only) ①								P									
Replace Fuller transmission air filter														P			
Clutch System																	
Lube clutch linkage pivots and clevises ⑤							P							P			
Lube clutch equalizer, idler lever and cross shaft, and all linkages							P							P			
Lube clutch release bearing and hub ⑦							P							P			
Fuel System																	
Inspect accelerator ball joints (rod assemblies)				P			P			P				P			
Inspect accelerator pivot shaft assemblies				P			P			P				P			
Torque check fuel tank support mounting bolts														P			
Replace one gallon fuel oil filter element														P			

NON-EMISSION SYSTEMS REQUIRED MAINTENANCE

800-900, 8000-9000 Series

Maintenance Schedule P (Cont'd.)

FOR ENGINE SIZE 7.8L (477 CID), 8.8L (534 CID) MAINTENANCE OPERATION	SERVICE INTERVAL Time in months or miles (or kilometers) in thousands, whichever occurs first, unless otherwise specified. Note — Scheduled maintenance beyond 50,000 miles (80,000 km) should be continued at the same intervals as before except as noted.															
	MONTHS	1	4	8	12	16	20	24	28	32	36	40	44	48		
MILES	1	4	8	12	16	20	24	28	32	36	40	44	48			
KILOMETERS	1.6	6.4	12.8	19.2	25.6	32.0	38.4	44.8	51.2	57.6	64.0	70.4	76.8			
Steering System																
Check manual steering gear lubricant level ⑥	⑥															P
Lube steering column U-joints when equipped with grease fittings ①								P								P
Lube steering linkage when equipped with grease fittings ②							P									P
Lube front axle spindle pins ③				P			P			P						P
Repack and adjust front wheel bearings ④ ⑤																P
Torque power steering pump mounting bracket bolts	⑥															P
Check power steering pump fluid level	⑥			P			P			P						P
Stemco wheel seals — drain oil, adjust bearings and refill with rear axle lubricant																P
Check "L" series adjustable steering column for looseness. Adjust as required					P		P				P					P
Torque front axle spindle taper pin nuts ④	REQUIRED AT FIRST 500 MILES ONLY															

NOTES:

- ① **SEVERE SERVICE OPERATION: WHEN OPERATING YOUR VEHICLE UNDER ANY OF THE FOLLOWING CONDITIONS, CHANGE ENGINE OIL EVERY 3 MONTHS OR 3,000 MILES (4,800 KILOMETERS), WHICHEVER OCCURS FIRST, AND REPLACE OIL FILTER AT ALTERNATE OIL CHANGES. CLEAN, CHECK AND REGAP SPARK PLUGS EVERY 6,000 MILES (9,600 KILOMETERS).**
- EXTENDED PERIODS OF IDLING OR LOW SPEED OPERATION SUCH AS DOOR-TO-DOOR DELIVERY.
 - OPERATION WHEN OUTSIDE TEMPERATURE REMAINS BELOW +10°F (-12°C) FOR 60 DAYS OR MORE AND MOST TRIPS ARE LESS THAN 10 MILES (16 KILOMETERS).
 - OPERATION IN SEVERE DUST CONDITIONS.
 - EXTENDED PERIODS OF HIGH SPEED OPERATION WITH FULLY LOADED VEHICLE (MAX. GVW).

② Adjust, service or replace as required with same or equivalent part.

③ If so equipped.

④ Also a noise emission control service.

⑤ Check restriction indicator daily. Clean or replace element when indicator shows red.

⑥ Required at this interval for initial service only. Thereafter, perform only at major intervals as indicated in the schedule.

⑦ Required at first 500 and 1,000 miles (800 and 1,600 kilometers) and at 500 and 1,000 miles (800 and 1,600 kilometers) after each wheel removal.

⑧ Perform at specified miles/kilometers or 6 months, whichever occurs first.

⑨ Perform at specified miles/kilometers or 12 months, whichever occurs first.

⑩ Perform at specified miles/kilometers or 18 months, whichever occurs first.

⑪ Required each 48,000 miles (76,800 kilometers) for on-highway operation, at each 12,000 miles (19,200 kilometers) for off-road operation, and at each 8,000 miles (12,800 kilometers) for severe duty operation.

⑫ See the diesel engine Manufacturer's Service Policy or Operator's Manual for service requirements, intervals, performance specifications, and adjustments.

⑬ Replace wheel seal whenever a hub assembly is removed.

⑭ All axles except 9,000 lb. (hydraulic brakes) C and L-Series and 12,000 lb. (hydraulic brakes) L-Series.

INSPECT means a visual observation of a system.

CHECK means a functional measurement of a system's operation (performance) — correct as required.

BRONCO, E-100 — E-350 AND F-100 — F-350 NON-SCHEDULED MAINTENANCE

The following maintenance operations are not required at definite mileage or time intervals, but should be performed when needed.

Maintenance Operation	Frequency — Observation
Clean body/door drain holes.	At least twice annually.
Lubricate door and tailgate hinges and checks.	Doors bind during opening or closing, or noisy operation.
Lubricate door locks, door latches, and hood latch.	Difficult to operate or noisy.
Check the battery and recharge if necessary. Check connections for tightness. Clean corrosion from terminal and top of battery.	Starter turns engine slower than usual. Headlights are brighter when engine is speeded up from idle.
Check engine oil level.	As required — at each fuel stop.
Check A/C liquid line sight glass for bubbles. If bubbles persist, add enough charge to clear the sight glass plus ½ pound. (Econoline only).	Seasonal or as required.
Check headlamp alignment.	Light beam appears too high or too low while driving with a normal load.
Check alternator and regulator output.	Slow engine cranking, hard starting, headlights dim at engine idle speed, early or repeated electrical component malfunction.
Check operation of lights, horn, turn signals, windshield wipers and washers, instruments, vent system, heater and accessories.	As required.
Check seat and shoulder belt buckles, release mechanisms and belt webbing.	As required.
Inspect the seat latches for proper operation.	As required.
Replace windshield wiper blades.	Wiper blades do not clean windshield after windshield and blades have been properly cleaned.
Check windshield washer fluid level — add fluid if required. (Check aim of windshield washer jets.)	When fueling, after extended use, or if washers do not spray fluid when operated.
Check for fuel, coolant, oil or other fluid leaks.	At frequent intervals.
Check fluid levels in the front axle, manual transmission, transfer case, and rear axle. Back the plug out slowly and if seepage occurs around the threads, the specified amount of lubricant is present. Turn the plug back in immediately to avoid further seepage. Replace fluid daily if the vehicle is operated in water or if fluid level check indicates entrance of water.	When malfunction is suspected or fluid leakage or contamination is observed or after operation in water.
Replace rear axle fluid for Dana axles.	After each 5,000 miles (8000 km) of severe service such as towing a Class II, III or Class IV trailer.
Check manual steering gear lubricant level.	Periodically and if lubricant leakage is observed.
Check power steering reservoir and automatic transmission fluid levels. Add fluid if required.	Periodically and if fluid leakage is observed.
Lubricate accelerator linkage (carburetor ball stud) with the specified lubricant.	Accelerator linkage is sluggish.
Lubricate clutch and transmission linkage. To avoid attracting dust and grit to the lube points, do not overlubricate.	Linkage action is sluggish.
Check and adjust clutch pedal free play (¾"/19mm minimum).	Adjust as required to maintain 1½" to ¾" (38-19mm) free play.
Check and adjust transmission controls and shift operation.	When hard shifting is encountered.
Lubricate automatic transmission kickdown linkage.	Abnormal accelerator pressure needed for forced downshift.
Check and lubricate parking brake linkage.	If excessive foot pedal travel is required or operation is sluggish.
Adjust the parking brake.	Parking brake does not hold the vehicle on a reasonable grade.

CY1736-2E1

BRONCO, E-100 — E-350 AND F-100 — F-350 NON-SCHEDULED MAINTENANCE (Continued)

Maintenance Operation	Frequency — Observation
Check parking gear mechanism on automatic transmission equipped vehicles.	Any malfunction or failure of holding action when transmission lever latched in P (Park) position.
Check brake warning light operation.	At engine start-up.
Adjust the service brakes.	Increased brake pedal travel or repeated pulling to one side.
Adjust steering gear preload and/or front wheel bearings. Check suspension, steering, and frame for loose attachments.	Excessive steering wheel play, loose steering system or front wheel shimmy.
Check the spring leaves for being evenly stacked and the spring clips or U-bolts, rear spring front eye bolt and shackle bolts for being tight.	While the vehicle is hoisted for lubrication.
Tighten frame mounted fuel tank strap bolts.	Driving conditions or inspection indicates looseness.
Check the driveshaft.	At frequent intervals when operating off-highway.
Remove excessive mud build-up from wheels, undercarriage and steering linkage. Inspect for and correct any bent or damaged components.	At frequent intervals when operating off-highway or if front wheel shimmy is experienced.
Flush complete underside of the vehicle. Inspect all underbody components for damage or deterioration.	Several times annually.
Inspect and rotate tires and check tire pressures.	Poor handling characteristics and/or abnormal tire wear are experienced.
Check tires, wheel balance and front wheel toe. (Caster and camber are preset and do not require adjustment on the Twin I-Beam front suspension.)	Poor handling characteristics and/or abnormal tire wear are experienced.
Inspect engine accessory drive belts and tighten (as required).	Squealing noise emanates from the engine compartment.
Inspect the entire exhaust system (including inlet pipe, muffler, outlet pipe, heat and brush shields, resonator, diffuser and all exhaust system clamps and fasteners) for holes, leakage, breakage, looseness and corrosive damage.	Excessive noise emanates from the exhaust system or the smell of fumes is experienced.
Inspect engine air induction system (including air duct, air cleaner, air cleaner element) for loose fitting, damaged or missing components	Excessive noise emanates from the engine compartment.
Inspect the fan and fan shroud for damage.	Excessive noise emanates from the engine compartment.
Inspect the fan clutch (if so equipped) for proper operation.	Engine overheats or fan runs at high speed constantly.
Inspect body, windshield and seals for leaks or cracks.	Excessive noise or draft inside vehicle.

CY1736-2E2

600-700 AND 7000 SERIES NON-SCHEDULED MAINTENANCE

The following maintenance operations are not required at definite mileage or time intervals, but should be performed on an "as required" basis. Have your authorized dealer check these items when your truck's performance indicates the necessity.

Maintenance Operation	Frequency — Observation
Clean body door drain holes.	At least twice annually.
Replace windshield wiper blades.	If wiping the blades with a clean cloth and mild detergent and washing the windshield with a cleaner does not restore a clean wipe.
Lubricate body lock cylinders, door hinges and checks, and hood hinges and latch.	Difficult to operate or noisy.
Check headlight alignment.	Light beams in wrong position when truck operating loaded.
Check windshield washer fluid level. Add fluid if required.	If washers do not spray fluid when operated.
Adjust brakes. (b)	Insufficient power shown in loaded practice stop.
Check operation of brakes, clutch, and steering. (b) (c)	Vehicle handling qualities not up to par.
Check steering stop adjustment. (b)	When front wheel alignment is checked and if front wheels rub on undercarriage or body sheet metal when turning.
Adjust manual steering gear preload and change steering gear lubricant. (a) (b)	If excessive steering effort is experienced. When operating at sustained extreme low ambient temperatures. (e)
Inspect the vehicle for missing, damaged, or mislocated chassis and body mounted noise shields. (f)	Excessive noise emanates from under the cab or engine compartment.
Check engine performance, and engine governor (electronic for gasoline engines or mechanical for diesel engines). (f)	Excessive engine noise.
Inspect diesel engine mounted noise hardware for damage or oil/fuel saturation, i.e., block panels, oil pan covers, treated valve covers. (f)	Excessive engine noise emanates from under cab or engine compartment.
Inspect the fan, fan shroud, fan clutch, and radiator shutters. (f)	Engine overheats, fan runs at high speed constantly, or excessive fan noise, or fan wobble due to worn bearings.
Inspect the entire exhaust system (including inlet pipe, muffler, outlet pipe, and all exhaust system clamps and fasteners) for holes, leakage, breakage, looseness, and corrosive damage. (f)	Excessive noise emanates from the exhaust system or the smell of fumes is experienced.
Inspect engine air induction system (including air ducts, air cleaner, air cleaner element) for loose fitting, damaged, or missing components. (f)	Excessive noise emanates from the engine compartment.
Check hydraulic brake master cylinder fluid level and brake pedal adjustment. (b)	Excessive pedal effort.
Inspect tires and check air pressure. (b) (d)	Poor steering, wandering or excessive tire wear.
Balance wheels and tires. (b)	Vibration or abnormal tire wear indicates imbalance.
Check and adjust clutch pedal travel. (b)	Insufficient free travel or hard shifting.
Check front end alignment. (b)	Poor steering, wandering or excessive tire wear.
Check parking brake adjustment. (b)	Will not hold on a reasonable grade.
Check transmission and engine mountings. (b)	Hard shifting or excessive vibration.
Check and adjust transmission controls. (b)	High effort to shift or noisy transmission.
Check fuel pump pressure — electric pump (gasoline engines).	Insufficient full-throttle power or backfiring.
Clean radiator cap seal. Clean and inspect radiator cap surface on the radiator.	When cap does not hold pressure.
Reposition anti-lock wheel speed sensor.	Every time brake drum is removed.
Check battery terminals for corrosion.	Whenever electrical power supply has diminished.

(a) Adjust center mesh preload to 2-5 in-lbs. above the minimum specified worm bearing preload. Perform the adjustment at a temperature of 50°-75°F (10°-25°C).

(b) During maintenance and repair, protect nylon tube fuel and air brake lines from external heat, acids, and abrasion that could damage the lines.

(c) Check for linkage action and make certain spring force is adequate to maintain pedal free play.

(d) Refer to Part 50-11 in this manual.

(e) During moderate temperature adjust center mesh preload to the currently published service specifications and fill the gear housing with SAE 90 EP Hypoid Gear Lubricant. See Lubricant Specifications.

(f) Adjust, repair or replace as required with same or equivalent parts.

800-900 AND 8000-9000 SERIES NON-SCHEDULED MAINTENANCE

The following maintenance operations are not required at definite mileage or time intervals, but should be performed on an "as required" basis. Have your authorized dealer check these items when your truck's performance indicates the necessity.

Maintenance Operation	Frequency — Observation
Clean body/door drain holes.	Improper water drainage is suspected.
Replace windshield wiper elements.	If washing the blades with a mild detergent and washing the windshield with a cleanser does not restore a clean wipe.
Lubricate body lock cylinders, door hinges and checks, and hood latches and hinges.	Difficult to operate or noisy.
Check headlight alignment.	Light beams in wrong position when truck operating loaded.
Check windshield washer fluid level. Add fluid if required.	If washers do not spray fluid when operated.
Adjust brakes. (b)	Insufficient power shown in loaded practice stop.
Check operation of brakes, clutch, and steering. (c)	Vehicle handling qualities not up to par.
Adjust manual steering gear preload and change steering gear lubricant. (a) (b)	If excessive steering effort is experienced when operating at sustained extreme low ambient temperatures. (d)
Check front end alignment. (b)	Poor steering, wandering or excessive tire wear.
Check parking brake adjustment. (b)	Will not hold on a reasonable grade.
Inspect the vehicle for missing, damaged, or mislocated chassis and body mounted noise shields. (e)	Excessive noise emanates from under the cab or engine compartment.
Check engine performance, and engine governor (electronic for gasoline engines or mechanical for diesel engines). (e)	Excessive engine noise.
Inspect diesel engine mounted noise hardware for damage or oil/fuel saturation, i.e., block panels, oil pan covers, treated valve covers. (e)	Excessive engine noise emanates from under cab or engine compartment.
Inspect the fan, fan shroud, fan clutch, and radiator shutters. (e)	Engine overheats, fan runs at high speed constantly, or excessive fan noise.
Inspect the entire exhaust system (including inlet pipe, muffler, outlet pipe, and all exhaust system clamps and fasteners) for holes, leakage, breakage, looseness, and corrosive damage. (e)	Excessive noise emanates from the exhaust system or the smell of fumes is experienced.
Inspect engine air induction system (including air ducts, air cleaner, air cleaner element) for loose fitting, damaged, or missing components. (e)	Excessive noise emanates from the engine compartment.
Check transmission and engine mountings. (b)	Hard shifting or excessive vibration.
Check clutch or hydraulic brakes, master cylinders for proper fluid level.	Excessive pedal travel.
Inspect tires and check air pressure. (b)	Poor steering, wandering or excessive tire wear.
Balance wheels and tires. (b)	Vibration or abnormal tire wear indicates imbalance.
Check and adjust clutch pedal travel.	Insufficient free travel or hard shifting.
Check and adjust transmission controls. (b)	High effort to shift, or noisy transmission.
Check fuel pump pressure and flow — electric pump (gasoline engines).	Insufficient full-throttle power or backfiring.
Remove and clean radiator coolant level sightglass(es).	When coolant level is difficult to see.
Clean radiator cap seal. Clean and inspect radiator cap surface on the radiator.	When cap does not hold pressure.
Adjust anti-lock wheel speed sensor position.	Every time brake drums are removed.

- (a) Adjust center mesh preload to 2-5 in-lbs. above the minimum specified worm bearing preload. Perform the adjustment at a temperature of 50°-75°F (10°-25°C).
- (b) During maintenance and repair, protect nylon tube fuel and air brake lines from external heat, acids, and abrasion that could damage the lines.
- (c) Check for free clutch linkage action and make certain spring force is adequate to maintain pedal free play.
- (d) During moderate temperatures adjust center mesh preload to the currently published service specifications and fill the gear housing with SAE 90 EP Hypoid Gear Lubricant. See lubricant specification.
- (e) Adjust, repair or replace as required with same or equivalent parts.

SPECIFICATIONS

NON-MAINTENANCE FREE BATTERIES

Allowable Battery High Rate Charge Time Schedule ^①

Specific Gravity Reading	Charge Rate Amperes	Battery-Capacity-Ampere Hours	
		41	53
1.125-1.150 ^①	35	65 min.	80 min.
1.150-1.175	35	50 min.	65 min.
1.175-1.200	35	40 min.	50 min.
1.200-1.225	35	30 min.	35 min.
Above 1.225	5	^②	^②

^①If the specific gravity is below 1.125, use the time indicated for the 1.125 specific gravity, then charge at 5 amperes until the specific gravity reaches 1.260 at 80°F.

^②Charge at 5 ampere rate only until the specific gravity reaches 1.250 at 80°F.

^③At no time during the charging operation should the electrolyte temperature exceed 130°F.

NOTE: Battery must be at a temperature of at least 40°F before charging.

MAINTENANCE FREE BATTERIES-ALLOWABLE CHARGE TIME SCHEDULE 53 A.H. BATTERY

Open Circuit Voltage	Charge Rate — Amperes			
	5	10	20	30
Below 11.85	11 hrs.	5.5 hrs.	2.75 hrs.	1.75 hrs.
11.85-12.00	8 hrs.	4 hrs.	2 hrs.	1.5 hrs.
12.00-12.10	6 hrs.	3 hrs.	1.5 hrs.	1 hrs.
12.10-12.25	5 hrs.	2.5 hrs.	1.25 hrs.	45 min.
12.25-12.35	3 hrs.	1.5 hrs.	45 min.	30 min.
Above 12.35	2 hrs.	—	—	—
63 and 68 A.H. Batteries				
Below 11.85	13 hrs.	6.5 hrs.	3.25 hrs.	2 hrs.
11.85-12.00	10 hrs.	5 hrs.	2.5 hrs.	1.5 hrs.
12.00-12.10	8 hrs.	4 hrs.	2 hrs.	1.25 hrs.
12.10-12.25	6 hrs.	3 hrs.	1.5 hrs.	1 hr.
12.25-12.35	4 hrs.	2 hrs.	1 hr.	30 min.
Above 12.35	2.5 hrs.	—	—	—

CAUTION: Do not exceed 30 ampere charge rate. If gassing or spewing of the electrolyte occurs during charging, the charge rate must be reduced.

NOTE: Battery must be at a temperature of at least 40°F before charging.

CJ1464-2D

FRONT WHEEL TURN ANGLES (DEGREES) 600-9000 SERIES TRUCKS

Model	Axle Capacity (Lbs.)	Tire Size	Power Steering ^①	Manual Steering ^①
C-Series	6000, 7000 9000 12000 C.P. 12000 15000	All All All All All	49 37 Not Applicable 37 37	49 37 31 37 37
LN-600-700	5000, 5500 6000, 7000 9000 ^③ 9000 ^②	All All All All	44 40 40 31	44 40 40 31
F & B-600 700	5000, 5500 6000, 7000 9000 ^③ 9000 ^②	7.50, 8.25 x 20 9.00 x 20 All All All	44 34 40 40 31	44 34 40 40 31
L-LT-LTS-LN-LNT 800-9000	6000, 7000 9000 12000 16000, 18000, 20,000 16000, 18000, 20000 12000 Steer-Ease	All All All 11.00, 12.00 x 20 15.00, 16.50, 18.00 x 22.5 All	42 42 40 40 31 34	42 42 40 40 31 34
F-600 (4 x 4)	7500	All	40	40

^① Right and Left Wheel

^② Hydraulic

^③ Air

CF1714-2G

FRONT WHEEL ALIGNMENT SPECIFICATIONS — 600-9000 MEDIUM, HEAVY AND EXTRA HEAVY TRUCKS

Vehicle Model	Front Axle Capacity	Toe-In ②	Camber (Degrees)	Caster (Degrees)
F-600, LN-600 Hydraulic Brakes	5000 5500	3/16"-5/16" Empty Vehicle	5/8° ± 3/8°	3½° ± ½° F-B Series 4½° ± ½° LN Series
B-600, F-C-B-LN-600-700, LT-LNT-800, LT-800, F-C-LN-6000, C-7000, L-800-900, LN-800 Hydraulic Brakes	6000 7000	3/16"-5/16" Empty Vehicle	5/8° ± 3/8°	3½° ± ½° F-B Series (Medium) 4½° ± ½° LN (Medium) 3¾° ± ½° L-LN (Heavy) 3° ± ½° C Series
F-600-700, B-LN-600-700, LN-F-B-700, LN-7000, F-800 Air Brakes	7000 Medium	5/16"-7/16" Empty Vehicle	5/8° ± 3/8°	3° ± ½° F-B 3°30' ± ½° L
F-C-L-LN-700-7000, LT-800, LN-7000, C-L-LT-LTS-800-900, CT-LN-LNT-800 Hydraulic Brakes	9000	5/16"-7/16" Empty Vehicle	3/8° ± 3/8° LH C Series -1/8° ± 3/8° RH C Series 5/8° ± 3/8° All Except C Series	4° ± ½° All Except C Series 3° ± ½° C Series
L-LT-LN-LNT-800, L-LN-LNT-8000, LNT-9000, L-LN-LNT-900, F-LT-LNT-800, C-600-700, C-7000 Air Brakes	7000 Heavy	5/16"-7/16" Empty Vehicle	5/8° ± 3/8°	2°51' ± ½° C (9.5 Frame) 4°30' ± ½° C (9.76 Frame) 5° ± ½° L (Except Drop Frame) 3°30' ± ½° LN-LNT w/Drop Frame
F-LN-700, F-800, LN-7000, Air Brakes	9000 Medium	5/16"-7/16" Empty Vehicle	5/8° ± 3/8°	3° ± ½° F-B 3°30' ± ½° LN
L-LT-LTS-LN-LNT-800-900—8000-9000, LT-LNT-800, C-700-800-900-7000-8000, CT-800-900-8000 Air Brakes	9000 Heavy	5/16"-7/16" Empty Vehicle	5/8° ± 3/8°	5° ± ½° All L Except Drop Frame 3°30' ± ½° LN-LNT w/Drop Frame 2°51' ± ½° C w/9.5 Frame 4°30' ± ½° C w/9.76 Frame
L-LT-LTS-LN-LNT-C-CT-800-900, L-LT-LTS-LN-LNT-8000-9000, LNT-LT-800 C-8000, CT-8000, W-WT-9000 Air Brakes	12000	3/16"-5/16" Empty Vehicle	5/8° ± 3/8°	3° ± ½° C w/9.5 Frame L-W w/2° Wedge 3°30' ± ½° L w/Drop Frame 4°30' ± ½° C w/9.76 Frame
C-900, CT-800-900, CT-8000, LT-800-900, LTS-LN-LNT-8000-9000, LNT-LT-800, C-8000, CT-8000, Air Brakes	16000 18000 20000	5/16"-7/16" Empty Vehicle	5/8° ± 3/8°	3° ± ½° C w/16000 Axle 3½° ± ½° All w/16-18-20000 lb. Axles Except C

① The caster specifications shown are with the frame level from front to rear. Measure front to rear frame angle when checking alignment and compensate as follows.
If the front of the frame is lower than the rear, the actual caster angle is obtained by adding the frame angle to the caster angle shown on the checking equipment.
If the front of the frame is higher than the rear, subtract the frame angle from the caster angle shown on the checking equipment.

② Set toe to minimum with radial ply tires.

CF2471-2C

TANDEM SUSPENSION U-BOLT TORQUE LIMITS

Suspension	Description	(ft-lbs)	N·m
Hendrickson	Spring U-Bolt Nuts, RU-RUE Only	237-302	322-409
Reyco 101F	Spring U-Bolt Nuts	220-300	299-406

CA4866-2A

AXLE SHAFT FLANGE STUD NUT TORQUE LIMITS (ALL AXLES)

Thread Size	Torque Limits	
	(ft-lbs)	N·m
7/16-20	35-45	48-61
1/2-20	50-70	68-94
5/8-18	100-120	136-162
3/4-16	150-200	204-271

CA4864-1A

WHEEL TORQUE LIMITS — 600 THRU 9000 SERIES

Description	Nut Size	(ft-lbs)
Cast Wheel Rim Nut	3/4-10	220-260

CA4863-1A

TORQUE LIMITS — FRONT SUSPENSION AND REAR LEAF SPRING SUSPENSION — 600-900 SERIES

Torque limits are determined by these bolt and nut diameters.		
Dia. Inches	Torque Limit	
	(ft-lbs)	N·m
1/4	85-115 (in-lbs)	9.5-12
5/16	12-17	17-23
3/8	31-42	43-56
7/16	50-70	68-94
1/2	75-105	102-142
9/16	110-150	150-203
5/8	150-205	204-277
3/4	220-300	299-406
7/8	360-480	488-650
1.0	540-730	733-989

CA4865-1A

Lubrication Charts and Lubricant Specifications		PART 50-03	
APPLIES TO ALL MODELS			
SUBJECT	PAGE	SUBJECT	PAGE
LUBRICATION CHARTS	50-03-1	SPECIFICATIONS	50-03-6

LUBRICATION CHARTS

Important lubrication points for typical chassis and engines are shown in Figs. 1 thru 4. Vehicles with optional equipment may have slightly different or additional lubrication points. When special equipment

or accessories are installed on the truck, consult the manufacturer's literature for lubrication procedures. A table of recommended lubricants is included at the end of this Part.

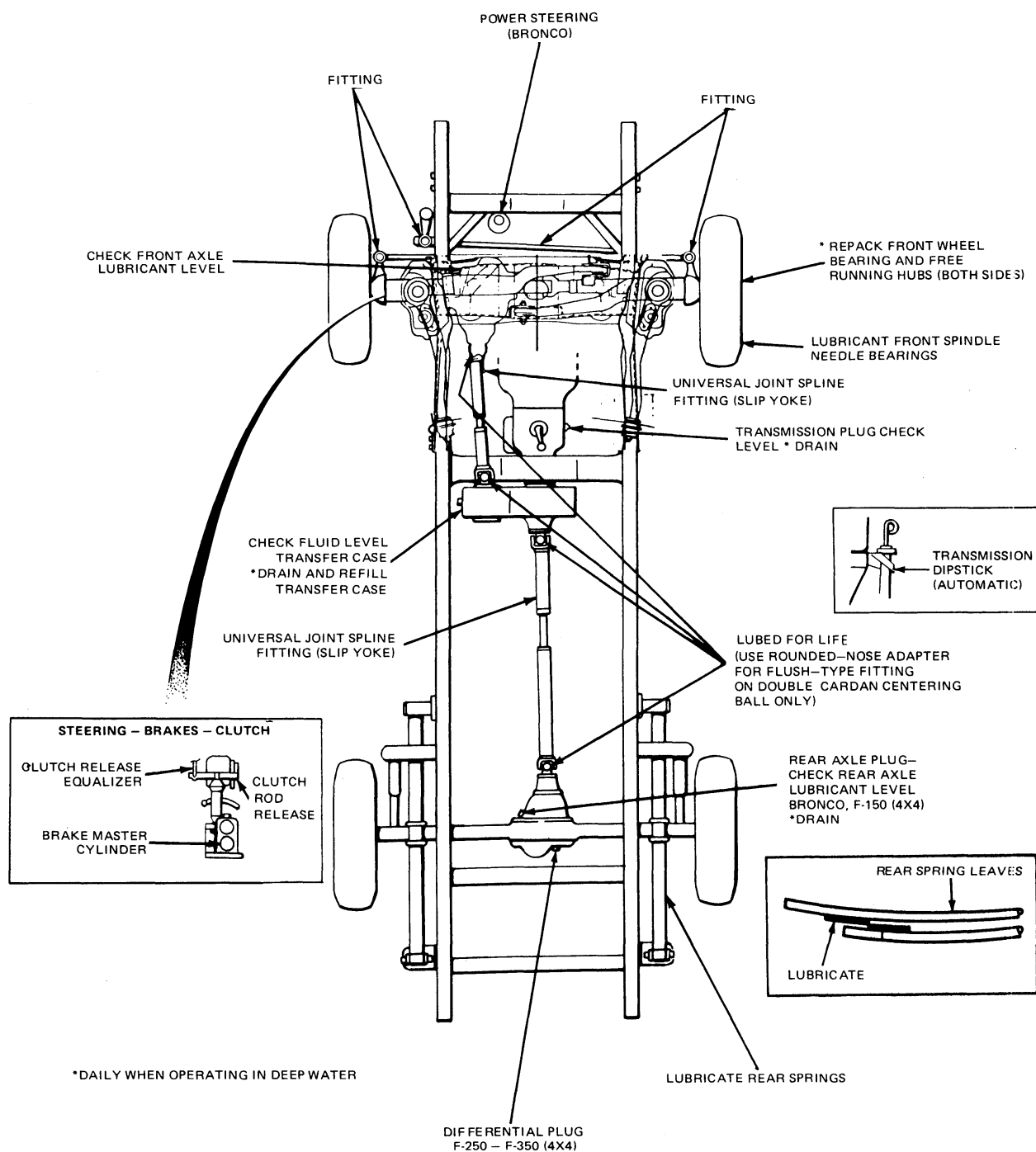
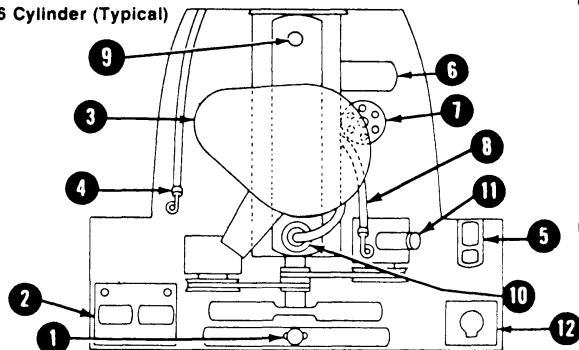


FIG. 1 Lubrication Chart—Typical Bronco and F-Series 4-Wheel Drive

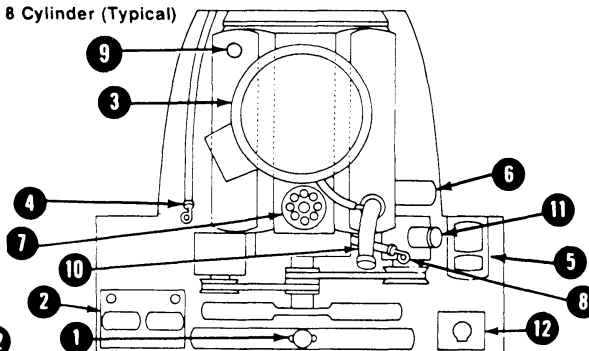
ROUTINE SERVICE

Engine Compartment Service Points

6 Cylinder (Typical)



8 Cylinder (Typical)



1 RADIATOR FILLER CAP

2 BATTERY

3 AIR CLEANER

4 AUTOMATIC TRANSMISSION
DIPSTICK

5 BRAKE MASTER CYLINDER

6 ENGINE OIL FILTER

7 DISTRIBUTOR

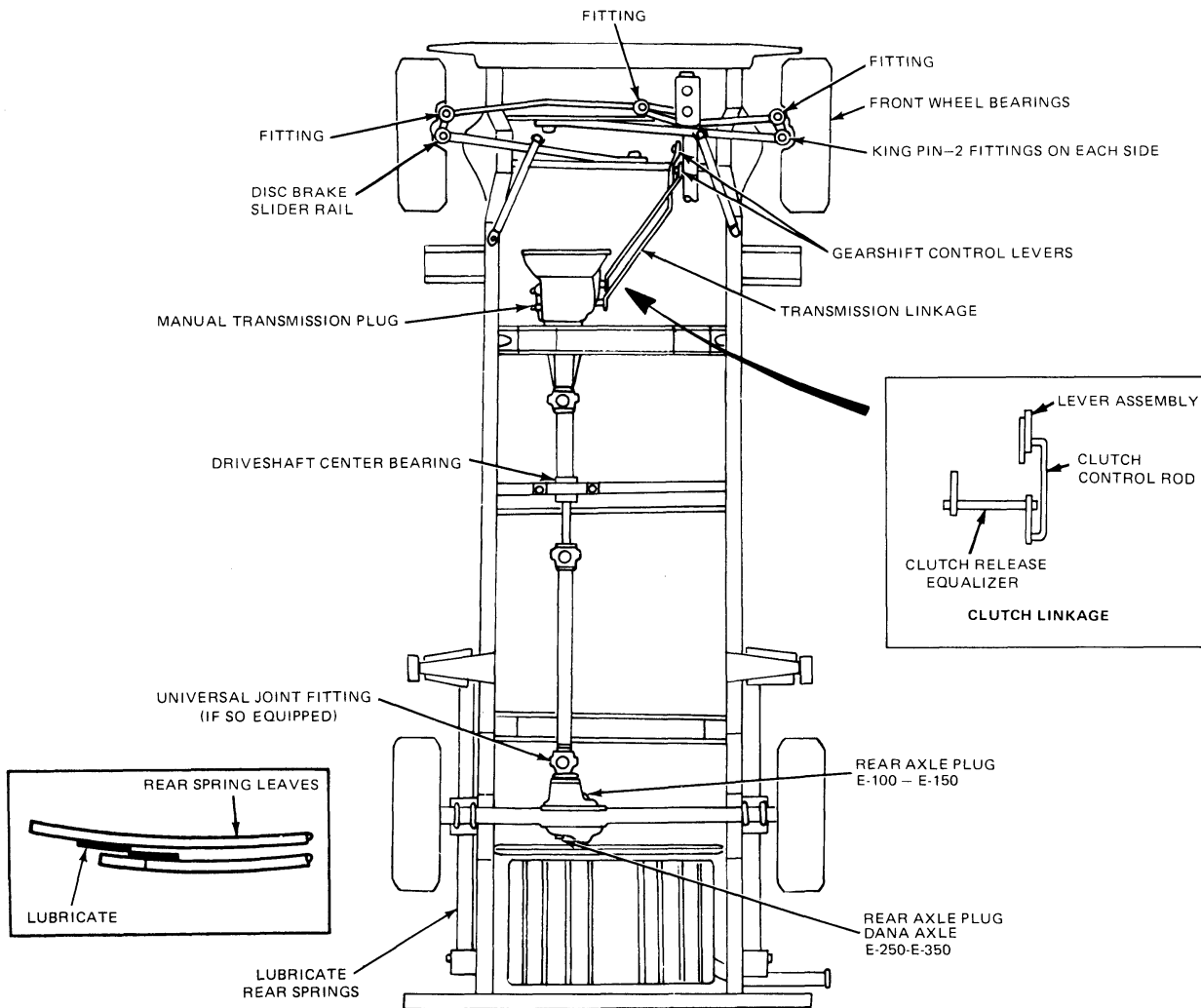
8 ENGINE OIL DIPSTICK

9 PCV VALVE

10 ENGINE OIL FILLER CAP

11 POWER STEERING RESERVOIR

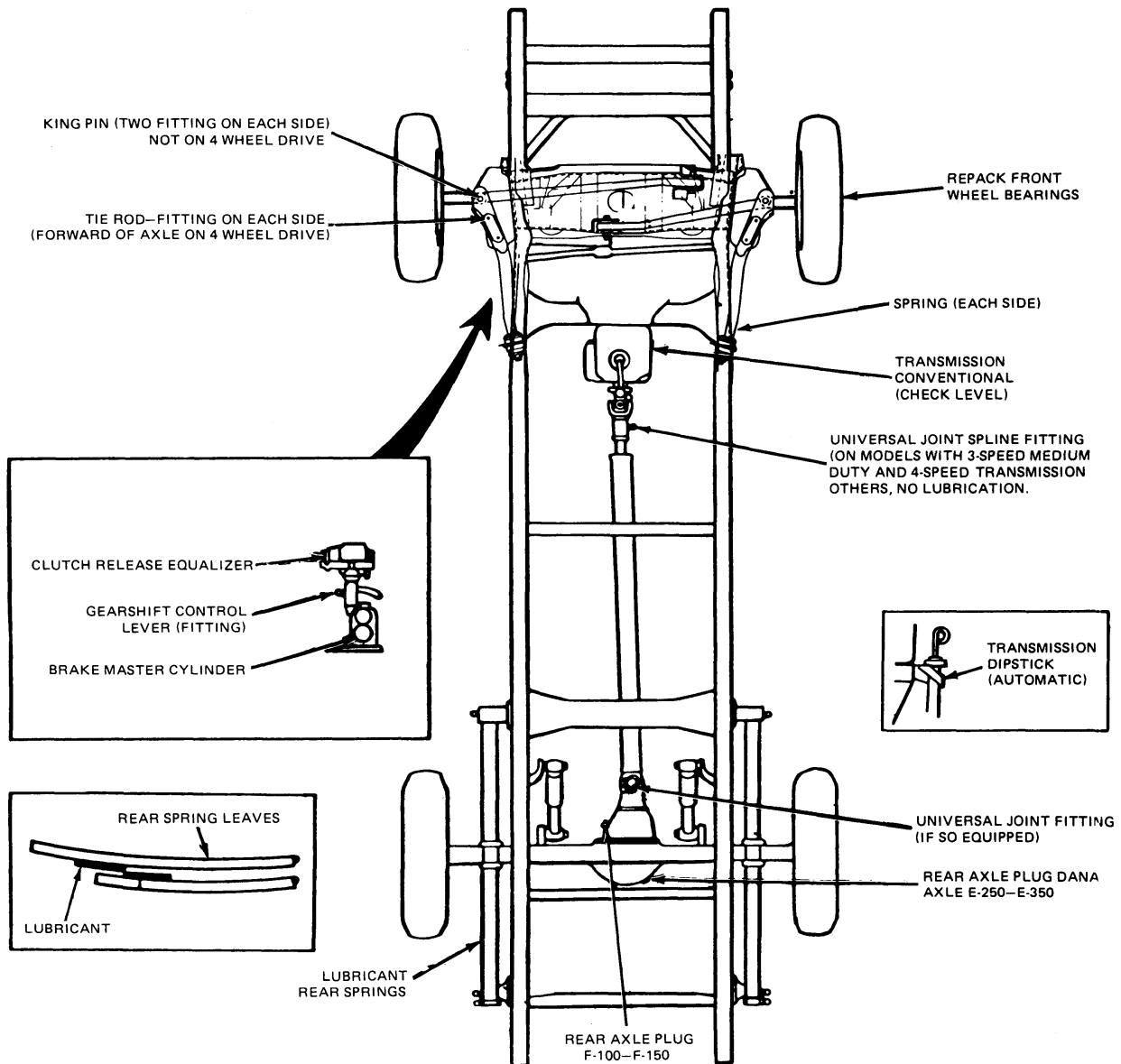
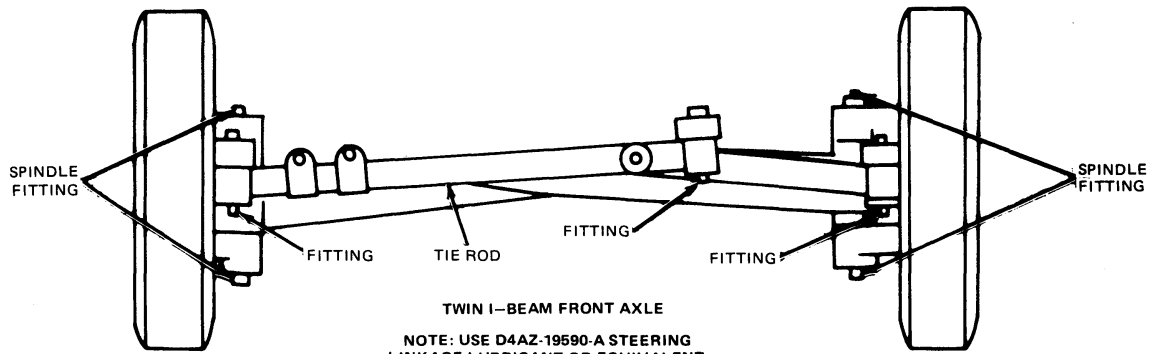
12 WINDSHIELD WASHER RESERVOIR



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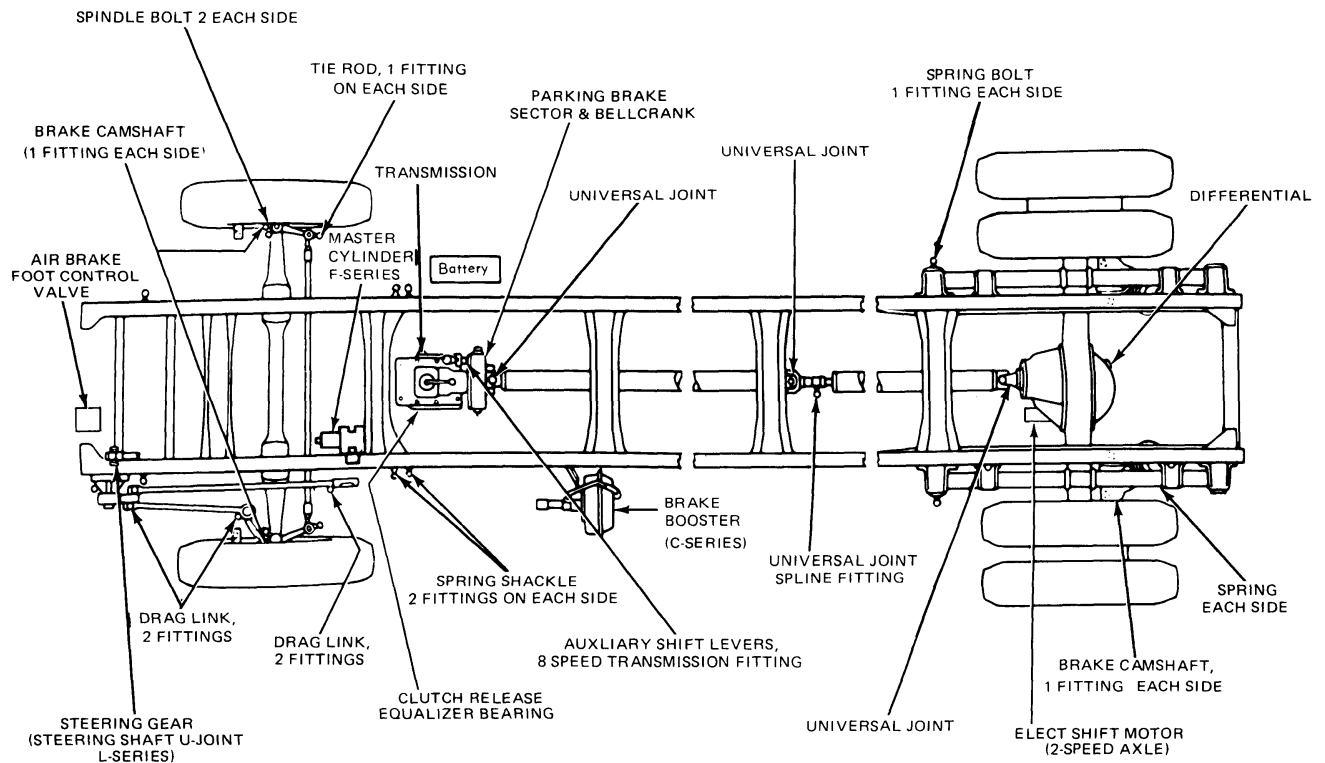
FIG. 2 Lubrication Chart—E-100—E-350

NOTE: USE C1AZ-19590-B BALL JOINT GREASE OR EQUIVALENT IN FITTING ONLY

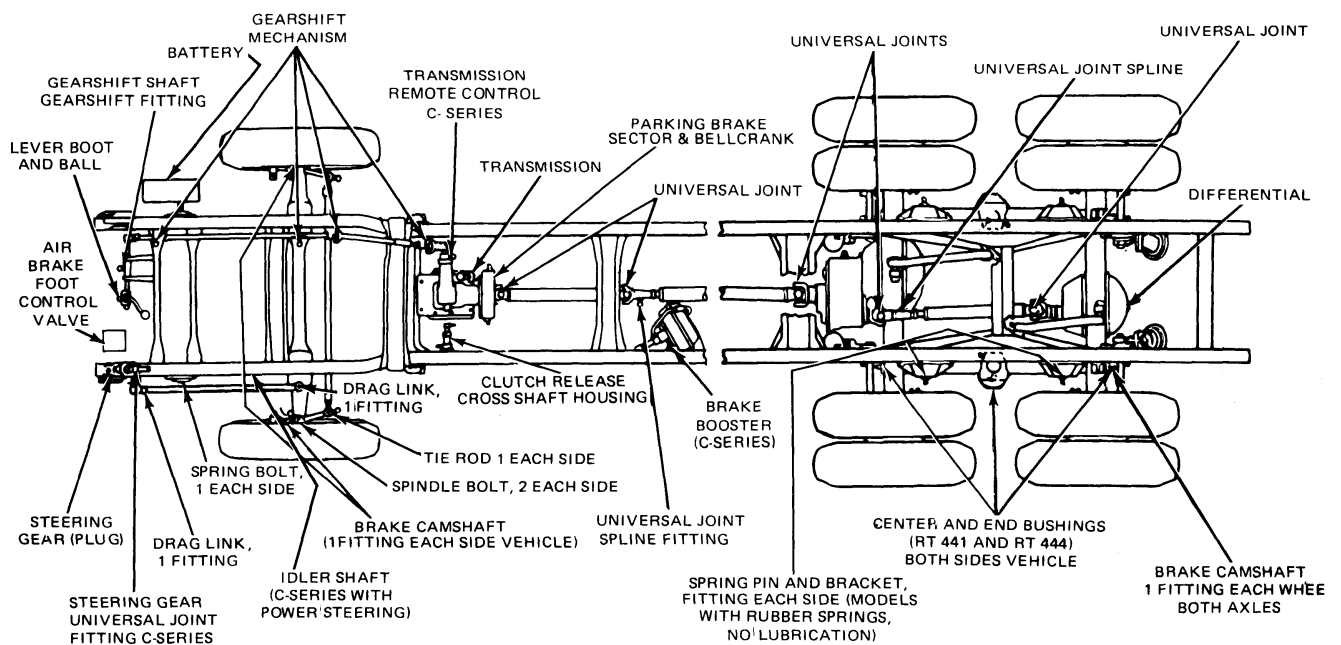


Y1026-2D

FIG. 3 Lubrication Chart—F-100/F-350 (Twin I-Beam Axle) Trucks



F, L, B, C, LN-SERIES SINGLE AXLE



CT AND LT SERIES TANDEM AXLE

Y1029-2J

FIG. 4 Lubrication Chart—600/900 Series Trucks

SPECIFICATIONS

Item	Vehicle Usage	Ford Part Name	Ford Part Number	Ford Specification
Windshield Washer Reservoir	E-100-350, F-100-350, Bronco	Ford Ultra-Clear Windshield Washer Solvent	C9AZ-19550-A or B	ESR-M17P5-A
Body Hinges, Latches, Door Striker Plates and Rotor, Seat Tracks, Door Tracks and Checks, Hood Latch and Auxiliary Latch	All	Polyethylene Grease	D7AZ-19584-A	ESB-M1C106-B
Lock Cylinders	All	Lock Lubricant	D8AZ-19587-A	ESB-M2C20-A
Distributor Bushing Oil Cap	Medium Truck, Heavy Truck,	Engine Oil SAE-10W	D3AZ-19579-K	ESE-M2C153-A or API "SE"
Distributor Cam	Medium Truck, Heavy Truck F-100-F-350	Distributor Cam Lubricant	C4AZ-19D530-A	ESB-M1C35-B
Front Axle Spindle Pins, Front and Rear Spring Shackle Pins, Steering Column U-Joints, Clutch Linkage Fittings, Universal Joints, Joints with Zerk Fittings, and Slip Yoke	Bronco, E-100-E-350 F-100-F-350	Multi-Purpose Lubricant	C1AZ-19590-B	ESA-M1C75-B
Brake Camshaft, Front and Rear	Medium Truck, Heavy Truck	Multi-Purpose Lubricant	C1AZ-19590-B	ESA-M1C75-B
Front and Rear Wheel Bearings (Except Rear Wheel Bearings on F-100, F-150, E-100-E-150), Brake and Clutch Pedal Shaft, F-150/250 4x4 Spindle Needle Bearings)	F-350 Bronco, E-100-350 Medium Truck, Heavy Truck	Multi-Purpose Lubricant	C1AZ-19590-B	ESA-M1C75-B
Steering (Manual) Housing	F-100-350 (Except Four Wheel Drive) E-100-E-350	Steering Gear Lubricant	C3AZ-19578-A	ESW-M1C87-A
Manual Steering Gear	Heavy Truck Medium Truck	Hypoid Gear Lubricant SAE-90 E9	C2AZ-19580-F	ESW-M2C28-BA
Power Steering	All	Auto. Trans. Fluid	C1AZ-19582-A, C, D Type 'F'	ESW-M2C33-F Type 'F'
Brake Master Cylinder Hydraulic Clutch Master Cylinder	Heavy Truck Medium Truck	Heavy Duty Brake Fluid	C6AZ-19542-A or B	ESA-M6C25-A
Spring Leaves, Transmission Linkage Pivots, Accelerator Ball Sockets, Brake and Clutch Pedal Pivots and Clevises,	Medium Truck, Heavy Truck	Engine Oil SAE-10W	D3AZ-19579-K	ESE-M2C153-A
Brake Clutch Pedal Pivots Clutch Linkage	Bronco E-100-350 F-100-350	Multi-Purpose Lubricant	C1AZ-19590-B	ESA-M1C75-B
Engine Oil — All Gasoline Engines ②	All	Premium or Super Premium Motor Oil	D3AZ-19579-G, K	ESE-M2C153-A (API "SE") ESE-M2C153-B (API "SF")
Engine Oil — All Diesel Engines	Medium Truck, Heavy Truck	Refer to Respective Engine Operators Manual		
Engine Oil Filter	Bronco, F-100-350, E-100-350, Heavy truck	Motorcraft Long Life Oil Filter	C1AZ-6731A FL-1	ESD5ZF-6714-AA or BA
Engine Oil Filter	Medium Truck Heavy Truck	Motorcraft Oil Filter 300 Motorcraft Oil Filter 370/429, 477/534	D9AZ-6731-A D3HZ-6731-B	ES-D5ZF-6714-AA or BA ES-D5ZF-6714-AA or BA

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Item	Vehicle Usage	Ford Part Name	Ford Part Number	Ford Specification
Spindle Needle Bearing	Bronco	Multi-Purpose Lubricant	C1AZ-19590-B	ESA-M1C75-B
C-4, C-6 Automatic Transmission	Bronco F-100 — F-350 E-100 — E-350	Automatic Transmission Fluid	D7-AZ-19582-A, B	ESP-M2C138-CJ or Dexron II
Allison Automatic Transmission	Medium Truck, Heavy Truck	Automatic Transmission Fluid	C1A-19582-A, C, or D	ESW-M2C33-F Type F
Accelerator Control Kickdown (Automatic 6 Cyl.)	E-100 — E-350 F-100 — F-350	SAE 10W Engine Oil		ESE-M2C-144-A
Speedometer, Parking Brake Cable	All	Speedometer Cable Lubricant	D2AZ-19581-A	ESF-M1C160-A
45° and 90° Speedometer and Tachometer Adapters	Medium Truck, Heavy Truck	Polyethylene Grease	D0AZ-19584-A	ESB-M1C93-A
Steering Linkage	F-100 — F-350, E-100 — E-350, Bronco	Steering Linkage Lube	D4AZ-19590-A	ESA-M1C48-A
Accelerator Linkage and Starting Motor	Medium Truck Heavy Truck	SAE 10W Oil	D3AZ-19579-K	ESE-M2C153-A
Accelerator Linkage	Bronco F-100 — F-350	Multi-Purpose Lubricant	C1AZ-19590-B	ESA-M1C75-B
Ford Axles (Conventional) (Rear)	Bronco F-100 — F-350 E-100 — E-350	Hypoid Gear Lubricant	E0AZ-19580-A	ESP-M2C154-A
Dana Axles (Front)⊙	Bronco F-150 — F-350 (4x4)	Hypoid Gear Lubricant	C6AZ-19580-B or E	ESW-M2C105-A
Ford Traction-Lok Axles (Rear)⊙	Bronco F-100 — F-150 E-100 — E-150	Hypoid Gear Lubricant	E0AZ-19580-A	ESP-M2C154-A
Transfer Case — Four Wheel Drive	Bronco, F-150, F-250 — F-350 (4x4)	Automatic Transmission Fluid	D7AZ-19582-AB	ESP-M2C138-CJ
4-Speed Manual Transmission	Bronco, F-150- F-250 — F-350 (4x4)	Standard Transmission Lube	D8DZ-19C547-A	ESP-M2C83-C
Front and/or Rear Dana Axles and Dana Limited Slip Front and Rear Axles⊙	F-150 — F-350 (4x4) F-250 — F-350 E-250 — E-350	Hypoid Gear Lubricant	C6AZ-19580-B or E	ESW-M2C105-A
3 Speed, 4 Speed Manual Transmission and 4 Speed Overdrive Transmission	F-100 — F-350 E-100 — E-350	Standard Transmission Lube	D8DZ-19C547-A —	— ESP-M2C83-C
Rear Axle 700 Series ⊙ Rear Axle 600 Series	Medium Truck	Rear Axle Lubricant (Lubricant must meet Ap-GL5 and MIL-L-2105-C with no Zinc Additives)	C6AZ-19580-E	ESW-M2C105-A
Rear Axle	Heavy Truck	Rear Axle Lubricant	C6AZ-19580-E	ESW-M2C105-A
Manual Shift, Main and Auxiliary Transmission	Medium Truck, Heavy Truck	Engine Oil SAE 50 — Above 0°F		ESE-M2C153-A
		SAE 30 — Below 0°F		ESE-M2C153-A
Two Speed Shift Unit	Medium Truck, Heavy Truck	Engine Oil SAE 10W Above 0°F		ESE-M2C153-A
		3 Parts SAE 10W Oil to 1 Part Kerosene — Below 0°F	—	ESE-M2C153-A
Transmission Remote Gearshift Lever, Auxiliary Transmission	Heavy Truck	Chassis Lubricant	C1AZ-19590-B	ESA-M1C75-B
Linkage and Transmission Cables, U-Joints (C-Series) Crank Arm and Side Bushing (C-Series)	Medium Truck	Chassis Lubricant	C1AZ-19590-B	ESA-M1C75-B
Transmission Remote Gearshift, Front Cross Shaft Tube (C-Series)	Medium Truck, Heavy Truck	Chassis Lubricant	C1AZ-19590-B	ESA-M1C75-B
Drive Shaft Slip Spline and Clutch Release Bearing Hub	Medium Truck Heavy Truck	Chassis Lubricant	C1AZ-19590-B	ESA-M1C75-B

Item	Vehicle Usage	Ford Part Name	Ford Part Number	Ford Specification
Driveshaft, Universal Joints (if equipped with fitting), Slip Spline and Spring Stud Shackles	Medium Truck F-100 — F-350 E-100 — E-350	Multi-Purpose Lubricant	C1AZ-19590-B	ESA-M1C75-B
Transmission Shift Lever Pivot and Crank Arm in Front Linkage (C-Series)	Medium Truck, Heavy Truck	Grease	D4AZ-19590-A	ESA-M1C92-A Type II
Exhaust Control Valve	4.9L Engine Bronco, E-100 — E-350, F-100 — F-350	Rust Penetrant and Inhibitor	C0AZ-19A501-A	ESR-M99C56-A
Engine Coolant	All	Cooling System Fluid	8A-19549-A	ESE-M97B18-C
Door Weatherstrip	All	Silicone Lube	C0AZ-19553-A	ESR-M13P4-A
Air Brake Foot Control Valve Linkage, Treadle Hinge and Roller	Heavy Truck	Lithium Base Grease	C1AZ-19590-B	ESA-M1C75-B
Stemco Front Wheel Seal Bearings	Heavy Truck	Rear Axle Lubricant	C6AZ-19580-E	ESW-M2C105-A
Drive Shaft, Slip Spline, Double Carden Joint Center Ball	Bronco, F-150- F-250-F-350 (4x4)	Multi-Purpose Lubricant	C1AZ-19590-B	ESA-M1C75-B
Rear Springs	E-100 — E-350 F-100 — F-350	Multi-Purpose Lubricant	C1AZ-19590-B	ESA-M1C76-B

- ① Add EST-M2C118A (Friction Modifier Part No. C8AZ-19B546-A) for complete refill of Dana limited slip axles. Add 4 ounces for E-250-E-350 and F-250-F-350 limited slip rear axles. Add 2 ounces for Bronco and F-150 (4x4) with limited slip.
- ② Improved engine oils labeled "API Classified SF" (Ford Specification ESE-M2C153-B) are expected to be introduced during the 1980 Model Year. Oil labeled API, SF or in combination with other classification, i.e.: SF SE, SF CC, SF CD are preferred as they offer improved wear protection. These improved oils should be used as soon as they are available.
- ③ For 8.5" Traction-Lok axles: Drain lube and add (4) ounces ESW-M2C118-A at 7,500 mile scheduled maintenance. Repeat procedure every 7,500 miles for trailer towing and severe service.
- ④ Use Hypoid Gear Lubricant (SAE-140) for operation in temperatures above 0°F in Rockwell axle.

CY2046-2A

Hoisting, Jacking and Towing

**PART
50-04**

APPLIES TO ALL MODELS

SUBJECT	PAGE	SUBJECT	PAGE
HOISTING		TOWING — General (Cont'd.)	
Bronco, E-100 — E-350,		Vehicles with Automatic	
F-100 — F-350	50-04-1	Transmission	50-04-2
Medium and Heavy Trucks	50-04-1	Vehicles with Manual	
JACKING	50-04-1	Transmission	50-04-2
TOWING		General Wrecker Towing	
4-Wheel Drive	50-04-2	Procedure	50-04-1
Front Wheels Off Ground	50-04-2	Medium and Heavy Truck	50-04-2
General	50-04-1	Rear Wheels Off Ground	50-04-8

HOISTING

BRONCO, E-100—E-350, F-100—F-350

Damage to suspension and/or steering linkage components may occur when positioning hoist adapters. Front end adapters should be positioned carefully to ensure maximum contact under the center of lower suspension arms or spring supports as near wheels as practical. Rear suspension hoist adapters (forks) should be placed under spring mounting pads or rear axle housing, but adapters must not interfere with shock absorber mounting brackets.

MEDIUM AND HEAVY TRUCKS

Hoist adapters for heavy duty hoists should be positioned according to the hoist manufacturer's recommendations. Be sure the hoist has an adequate lifting capacity for the vehicle being lifted.

JACKING

CAUTION: On vehicles equipped with a limited-slip differential, do not run the engine with the vehicle on a jack.

When lifting a vehicle with the vehicle jack or any floor jack, block the diagonally opposite wheel to prevent vehicle from moving.

CAUTION: On vehicles equipped with an under chassis mounted spare tire, remove the tire, wheel or tire carrier from the vehicle before it is placed in a high lift position in order to avoid sudden weight release from the chassis.

On Bronco, E-100—E-350 and F-100—F-350, position vehicle and floor jacks under axles, radius arms or spring hangers as close to the wheels as possible and as recommended in the vehicle owner's manual.

To raise heavy vehicles with floor jacks, follow the jack manufacturer's recommendations for placement of jack. Do not exceed the rated lift capacity of any jack.

TOWING

GENERAL WRECKER TOWING PROCEDURE

E-100—E-350 AND BRONCO

Preparatory Steps

Release the parking brake and place the transmission in neutral. As a general rule, towed vehicles should be pulled with the driving wheels off the ground. If the

driving wheels cannot be raised off the ground, either place them on a dolly or disconnect the driveshaft.

When a vehicle is pulled on its front wheels, the steering wheel must be clamped in the straight ahead position with a steering wheel clamping device designed for towing service use, such as those provided by towing system manufacturers. Do not use the column lock to

lock the front wheels in a straight ahead position when towing from the rear.

4-wheel drive vehicles are to be handled as follows:

1. Unlock the front hubs (Fig. 1). On vehicles equipped with automatic locking hubs, place hubs in AUTO position. On vehicles equipped with manual hubs, place hubs in FREE position.
2. Place transfer case in neutral.

NOTE: When the vehicle is towed in this configuration the wheels which are off the ground will turn.

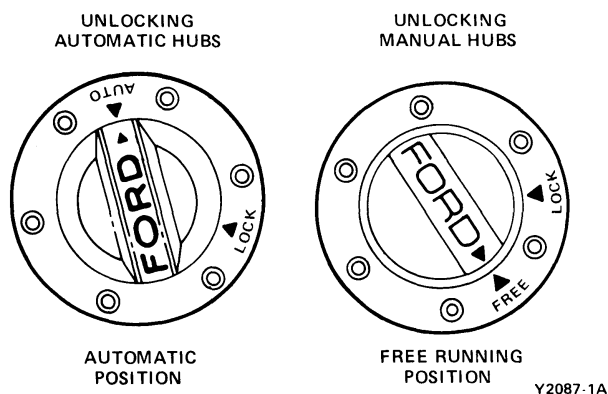


FIG. 1 Unlocking the Front Hubs

Towing Slings/Chains/Hooks

To avoid metal to metal contact and possible damage to chrome or lower body panels, a special wide-belt sling should be used to lift and tow ALL trucks. When attaching towing slings, take care to avoid damage to license plate and frame.

Towing chains must be fastened only to the arm or brackets that attach to the bumper to the frame.

CAUTION: Use caution when attaching tow hooks and safety chains to vehicle. Position and remove hooks with care to avoid damage to brake hoses and brake lines.

NOTE: On vehicles equipped with bumper guards, make sure the sling crossbar is under the bumper and the weight of the vehicle is not supported by the bumper guards.

Towing Speeds

When towing a vehicle with the front wheels off the ground do not exceed a speed of 56 km/h (35 mph) or a distance of 80 km (50 miles). If this distance or speed must be exceeded, disconnect the rear driveshaft.

With the rear wheels off the ground, speed is to be limited to 80 km (50 mph) on a smooth surface road. On rough pavement, do not exceed 56 km/h (35 mph).

WARNING: Improper towing of the vehicle could result in transmission damage. Always follow the outlined towing procedures. It is recommended that only an unloaded vehicle be towed when either the front or rear wheels are off the ground.

If towing with a minimal load is unavoidable, care must be taken to properly restrain load from shifting and distribute the load evenly in the pick-up box.

MEDIUM AND HEAVY TRUCK

Vehicles With Automatic Transmission

To tow a truck with an automatic transmission less than one mile, place the selector lever at N (NEUTRAL). Be sure that the brakes are released. Do not tow at speeds faster than 30 mph (48 km/h) with the rear wheels on the ground. If the truck must be towed more than one mile, or if the automatic transmission is inoperative, raise the rear wheels off the ground or remove the rear axle shafts and seal the ends of the housing to prevent the loss of axle lubricant before towing trucks with the rear wheels on the ground. New axle gaskets must be used when reinstalling the axle shafts.

NOTE: After towing any tandem axle equipped truck, allow the vehicle to sit on a level surface until lubricant equalizes in both axles. Loss of lubricant may also have occurred during towing—so check lubricant level of power divider and both axles and refill if low.

Trucks with automatic transmissions will not start by pushing or towing.

Vehicles With Manual Transmissions

To move a truck with an inoperative axle, it is necessary to raise the rear wheels. To tow the truck from the front, it is necessary to remove the driveshaft or rear axle shafts, whichever is more convenient. When the axle shafts are removed, the ends of the axle housing must be sealed to prevent loss of lubricant. New axle gaskets must be used when reinstalling the axle shafts.

It is important that towing chains be fastened only to the arm or brackets that attach the bumper to the frame. The chains must be routed under the bottom edge of the bumper. Make sure the parking brake is released and the transmission is in neutral. It is important to know that the transmission and rear axle are in proper working order before towing.

If the vehicle is to be towed with the rear wheels raised, a locking device should be installed to hold the front wheels in a straight-ahead position.

Special Situations

IT IS IMPORTANT THAT TOWING CHAINS BE FASTENED DIRECTLY TO THE TOW HOOKS ON VEHICLES SO EQUIPPED. ON VEHICLES NOT EQUIPPED WITH TOW HOOKS, TOWING CHAINS MUST BE ROUTED UNDER THE BOTTOM EDGE OF THE BUMPER, WITH PROTECTION BAR IN ORDER TO PROTECT THE BUMPER, AND ATTACHED TO THE VEHICLE CHASSIS, UNDER NO CIRCUMSTANCE IS THE VEHICLE TO BE LIFTED OR TOWED BY ATTACHING CHAINS DIRECTLY TO THE BUMPER MAKE SURE THE PARKING BRAKE IS RELEASED, ETC.

TOWING PROCEDURES

FRONT WHEELS OFF GROUND

Bronco/F-150 (4x4) Front Towing with J-Hooks

Refer to General Wrecker Towing Procedure in this part before attaching towing chains.

1. Attach J-Hooks under the axle outboard of the radius arm (Fig. 2).
2. Position sling crossbar under bumper on frame.
3. Attach safety chains around axle inboard of coil spring.
4. On vehicles equipped with automatic locking hubs (Fig. 1) place hubs in AUTO position. On vehicles equipped with manual locking hubs (Fig. 1), place hubs in FREE position.
5. Place transfer case in neutral.
6. Place transmission in neutral.
7. Do not exceed a speed of 56 km/h (35 mph) or a distance of 80 km (50 miles). If this speed or distance must be exceeded, disconnect the rear driveshaft.

Bronco/F-150 (4x4) Front Towing With T-Hooks

Refer to General Wrecker Towing Procedure in this part before attaching towing chains.

1. Insert T-hooks in T-hook slot in frame (Fig. 3).
2. Position sling crossbar under bumper on frame.
3. Attach safety chains around axle inboard of coil spring.
4. On vehicles equipped with automatic locking hubs (Fig. 1), place hubs in AUTO position. On vehicles equipped with manual locking hubs (Fig. 1), place hubs in FREE position.
5. Place transfer case in neutral.
6. Place transmission in neutral.
7. Do not exceed a speed of 56 km/h (35 mph) or a distance of 80 km (50 miles). If this speed or

distance must be exceeded, disconnect the rear driveshaft.

F-250/F-350 (4x4) Front Towing With J-Hooks

Refer to General Wrecker Towing Procedure in this part before attaching towing chains.

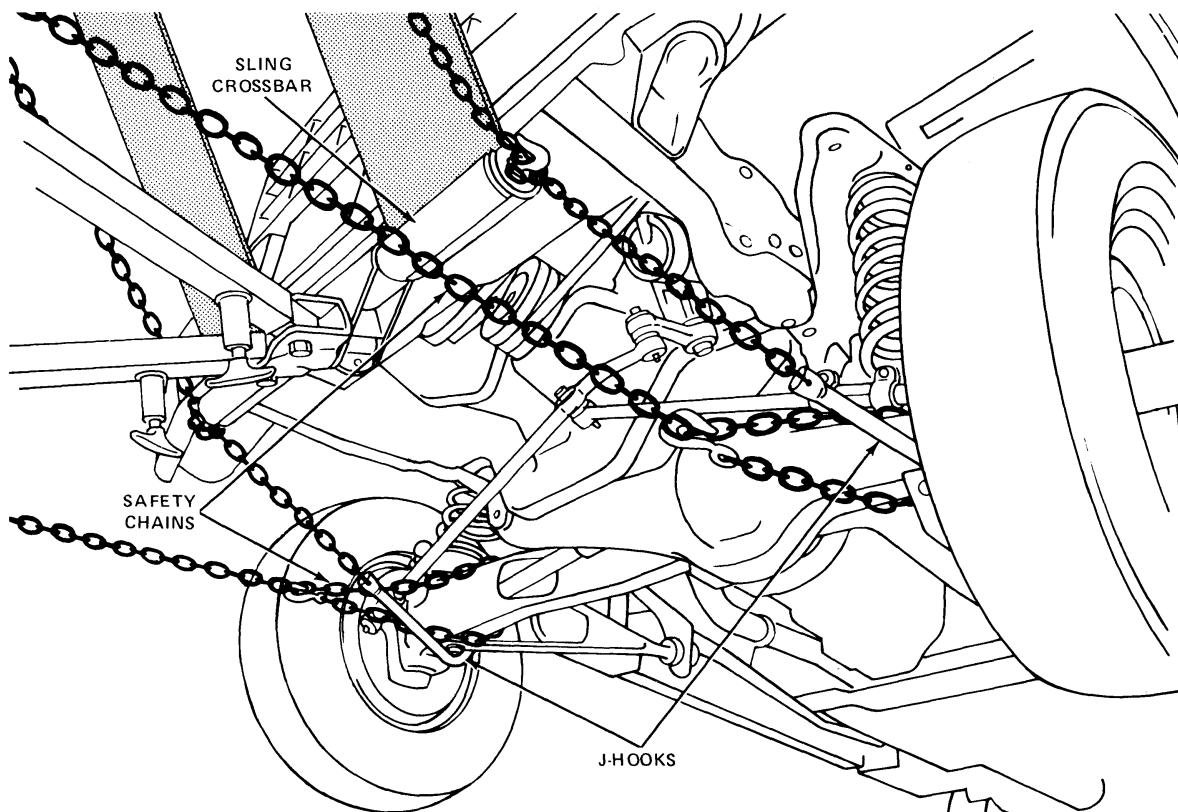
1. Place J-hooks under axle outboard of the leaf spring (Fig. 4).
2. Position sling crossbar under bumper on frame.
3. Attach safety chains around axle outboard of leaf spring.
4. On vehicles equipped with automatic locking hubs, place hubs in AUTO position (Fig. 1). On vehicles equipped with manual locking hubs, place hubs in FREE position (Fig. 1).
5. Place transfer case in neutral.
6. Place transmission in neutral.
7. Do not exceed a speed of 56 km/h (35 mph) or a distance of 80 km (50 miles). If this speed or distance must be exceeded, disconnect the rear driveshaft.

CAUTION: USE OF T-HOOKS NOT RECOMMENDED FOR F-250/F-350 (4x4).

F-100/F-150 (4x2) Front Towing With J-Hooks

Refer to General Wrecker Towing Procedure in this part before attaching chains.

1. Attach J-hooks over I-beam axle outboard of coil spring (Fig. 5).
2. Position sling crossbar under bumper on frame.



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FIG. 2 Front Towing Connections—J-Hooks—Bronco and F-150 (4x4)

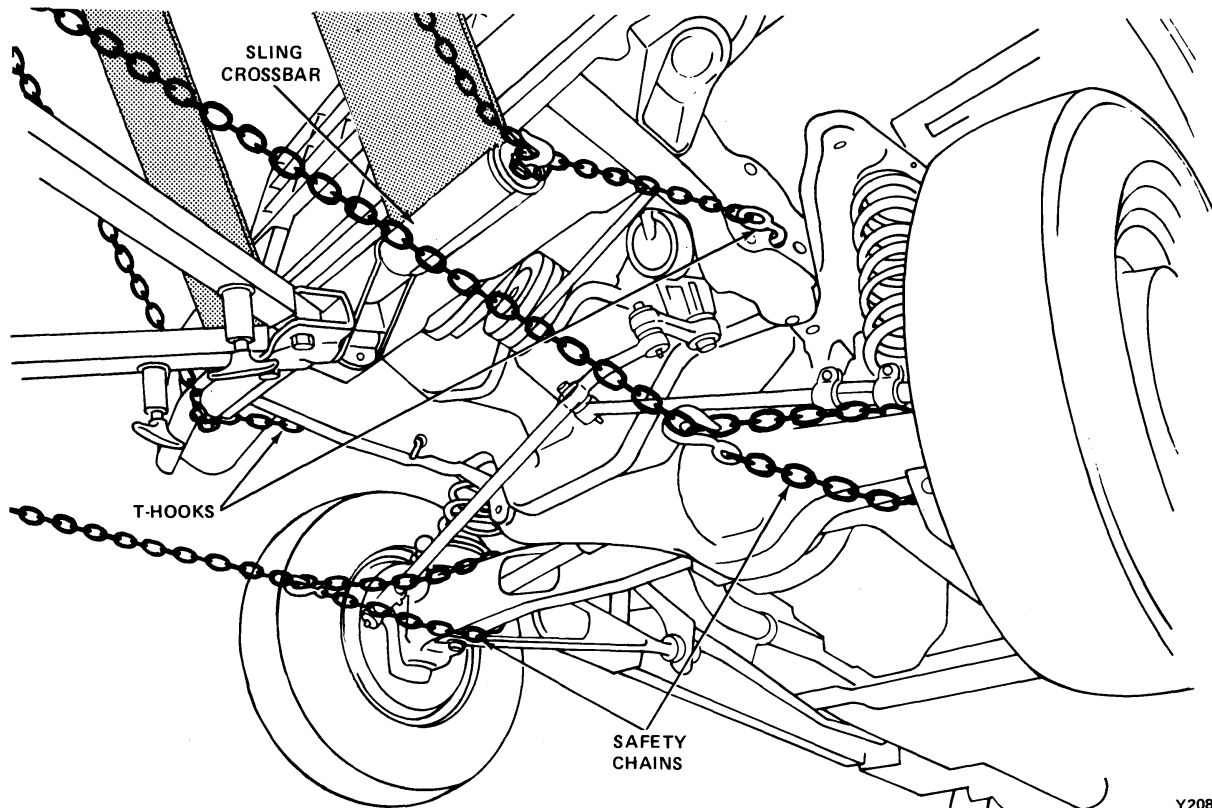


FIG. 3 Front Towing Connections—T-Hooks—Bronco and F-150 (4x4)

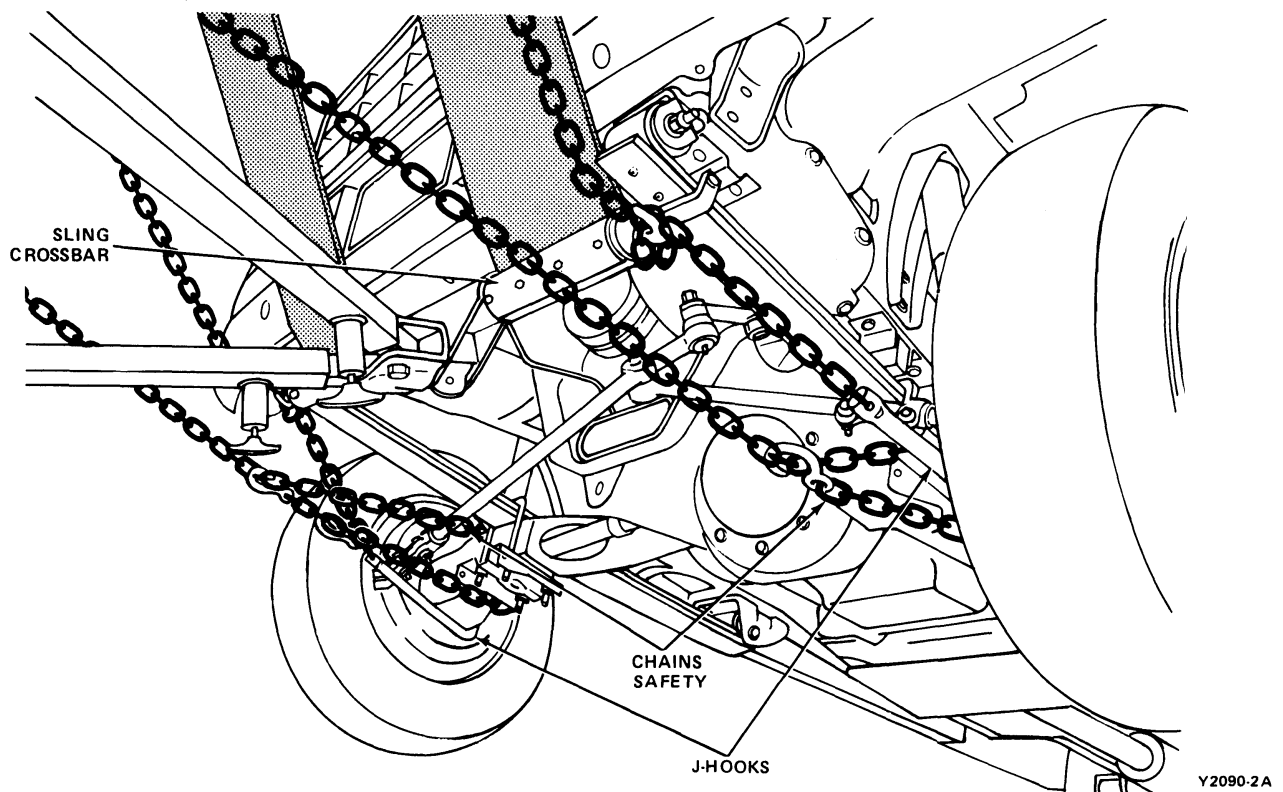


FIG. 4 Front Towing Connections—J-Hooks—F-250—F-350 (4x4)

3. Attach safety chains around I-beam axle outboard of the coil spring.
4. Place transmission in neutral.
5. Do not exceed a speed of 56 km/h (35 mph) or a distance of 80 km (50 miles). If this speed or distance must be exceeded, disconnect the driveshaft.

F-100/F-150 (4x2) Front Towing With T-Hooks

Refer to General Wrecker Towing Procedure in this part before attaching towing chains.

1. Insert T-hook in T-hook slot in frame (Fig. 6).
2. Position sling crossbar under bumper on frame.
3. Attach safety chains around axle outboard of coil spring.
4. Place transmission in neutral.
5. Do not exceed a speed of 56 km/h (35 mph) or a distance of 80 km (50 miles). If this speed or distance must be exceeded, disconnect the driveshaft.

F-250/F-350 (4x2) Front Towing With J-Hooks

NOTE: Use T-Hooks only when towing F-250/F-350 (4x2) when equipped with front stabilizer bars (Fig. 8).

Refer to General Wrecker Towing Procedure in this part before attaching towing chains.

1. Insert J-hooks over I-beam axle outboard of coil spring (Fig. 7).

2. Position sling crossbar under bumper on frame.
3. Attach safety chains around I-beam axle outboard of coil springs.
4. Place transmission in neutral.
5. Do not exceed a speed of 56 km/h (35 mph) or a distance of 80 km (50 miles). If this speed or distance must be exceeded, disconnect the driveshaft.

F-250/F-350 (4x2) Front Towing With T-Hooks

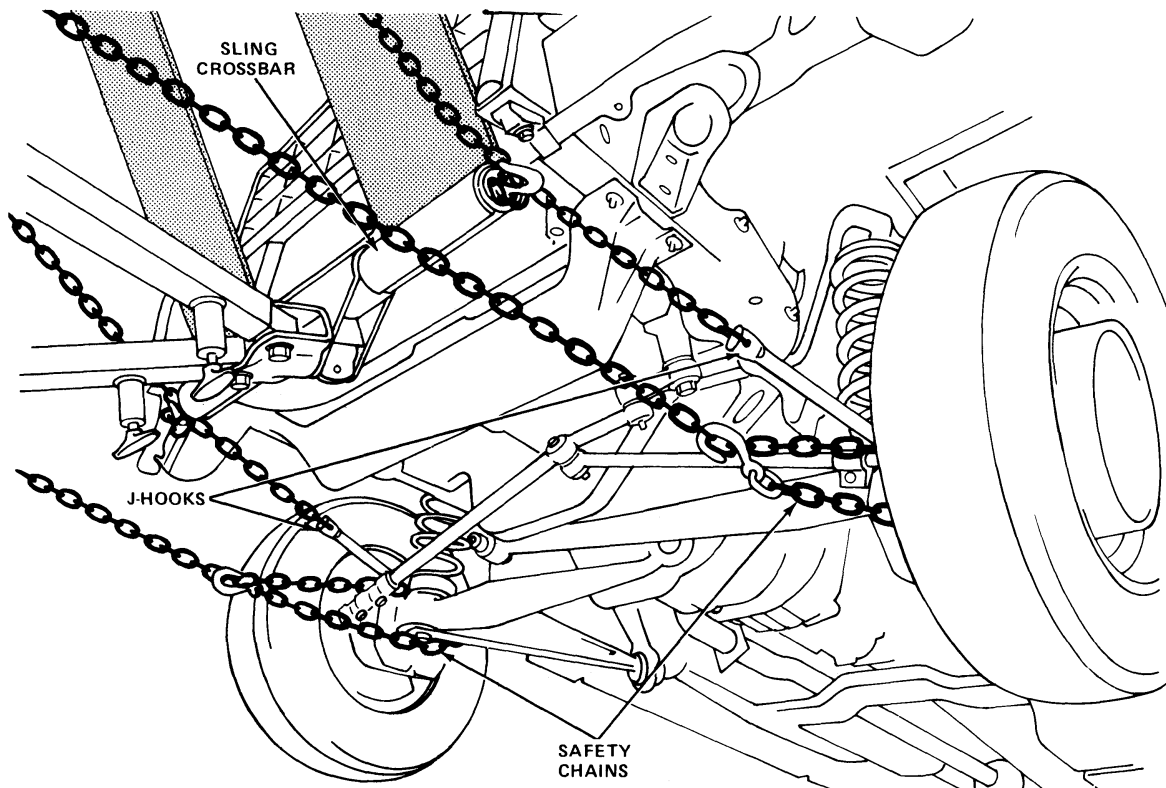
Refer to General Wrecker Towing Procedure in this part before attaching towing chains.

1. Insert T-hooks in T-hook slot in frame (Fig. 8).
2. Place sling crossbar under bumper on frame.
3. Attach safety chains around I-Beam axle outboard of coil spring.
4. Place transmission in neutral.
5. Do not exceed a speed of 56 km/h (35 mph) or a distance of 80 km (50 miles). If this speed or distance must be exceeded, disconnect the driveshaft.

E-100/E-150/E-250/E-350 Front Towing With J-Hooks

Refer to General Wrecker Towing Procedure in this part before attaching towing chains.

1. Attach J-Hooks outboard of the coil springs over the I-beam suspension arms from above the tie rod (hook in inverted position).
2. Position sling crossbar behind bumper (Fig. 9).



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FIG. 5 Front Towing Connections—J-Hooks—F-100—F-150 (4x2)

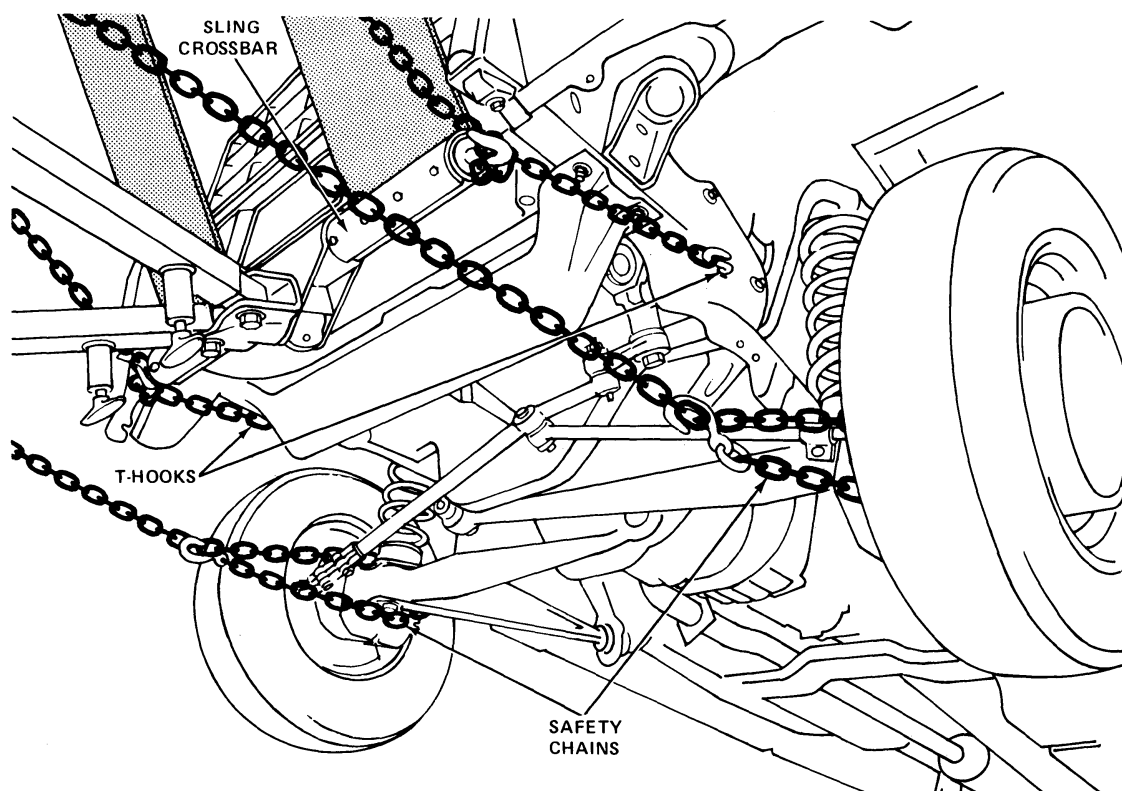


FIG. 6 Front Towing Connections—T-Hooks—F-100—F-150 (4x2)

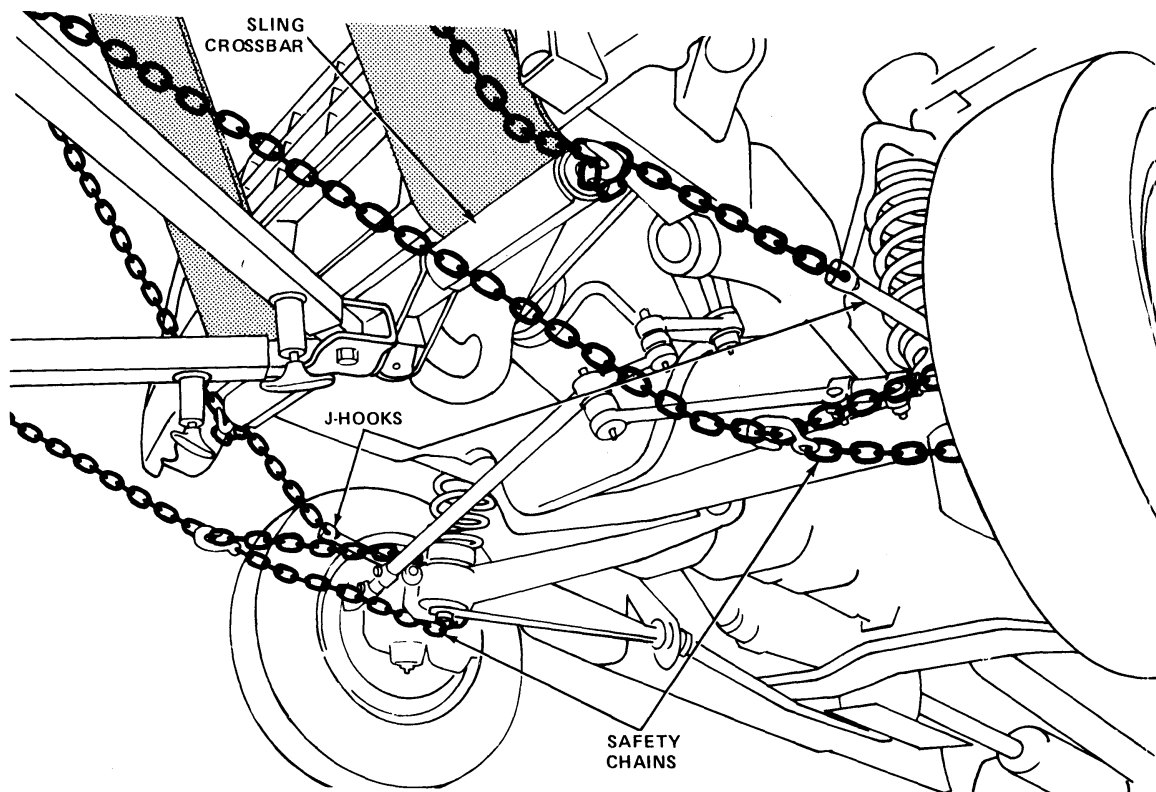


FIG. 7 Front Towing with J-Hooks—F-250—F-350 (4x2)

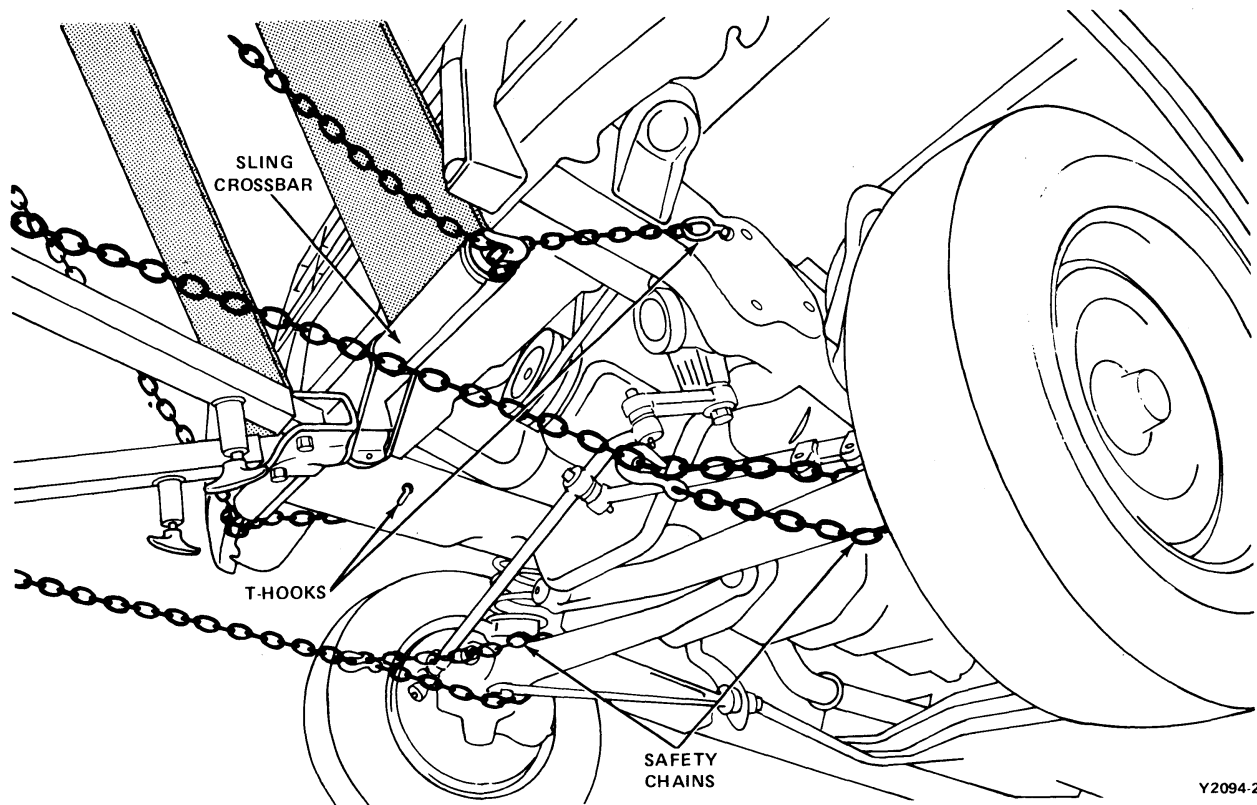


FIG. 8 Front Towing with T-Hooks—F-250—F-350 (4x2)

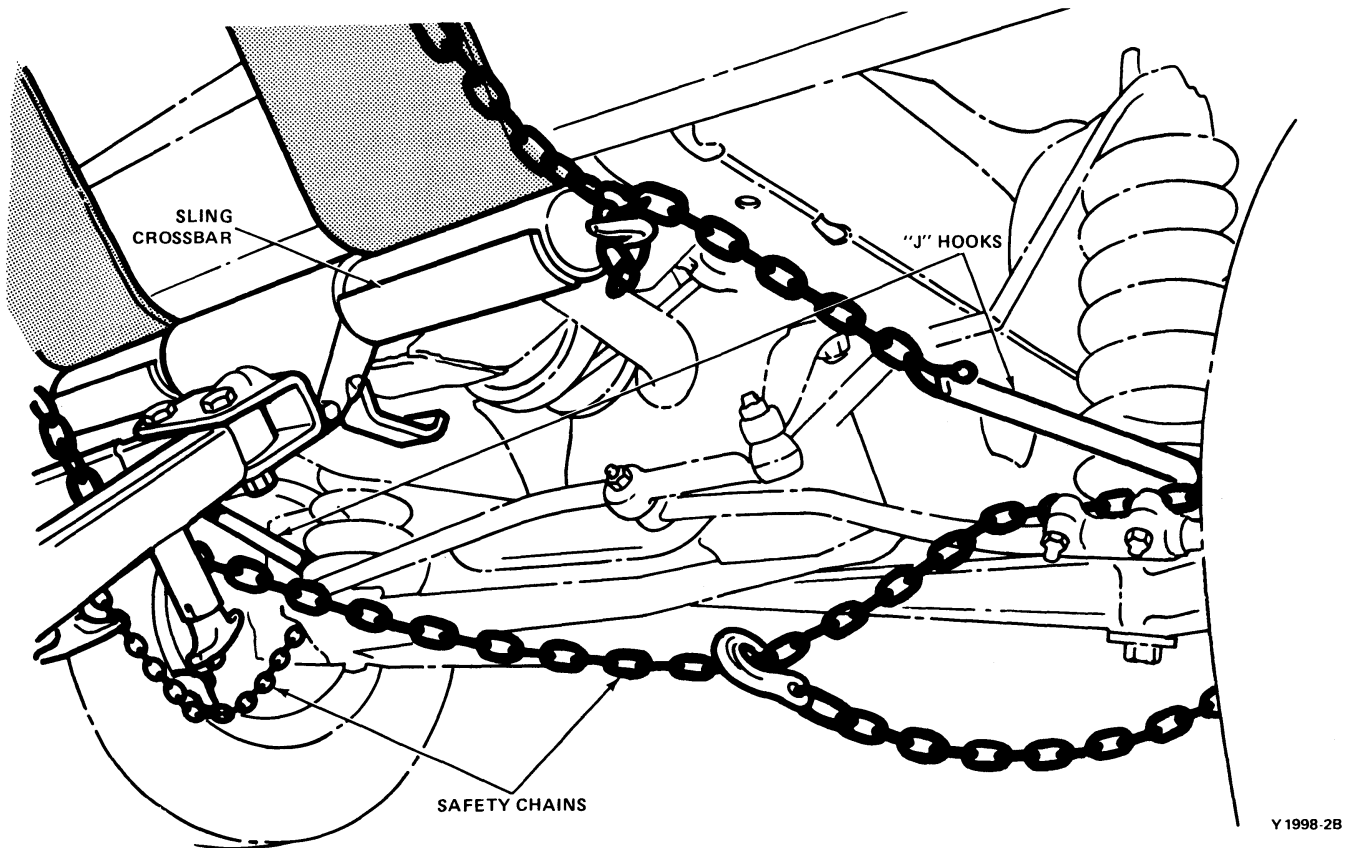


FIG. 9 Front Towing Connections—J-Hooks—E-100, E-150, E-250 and E-350

3. Attach safety chains around axle outboard of coil springs.
4. Place transmission in neutral.
5. Do not exceed a speed of 56 km/h (35 mph) or a distance of 80 km (50 miles). If this speed or distance must be exceeded, disconnect the driveshaft.

E-100/E-150/E-250/E-350 Front Towing With T-Hooks

Refer to General Wrecker Towing Procedure in this part before attaching towing chains.

1. Insert T-hooks in T-hook slot in frame (Fig. 10).
2. Position sling crossbar behind bumper.
3. Attach safety chains around axle outboard of coil springs.
4. Place transmission in neutral.
5. Do not exceed a speed of 56 km/h (35 mph) or a distance of 80 km (50 miles). If this speed or distance must be exceeded, disconnect the driveshaft.

REAR WHEELS OFF GROUND

Bronco Rear Towing With J-Hooks

Refer to General Wrecker Towing Procedure in this part before attaching towing chains.

1. Attach J-hooks under axle outboard of leaf springs (Fig. 11).
2. Position sling crossbar under bumper on frame.
3. Attach safety chains around axle inboard of leaf spring seat.
4. On vehicles equipped with automatic locking hubs, place hubs in AUTO position (Fig. 1). On vehicles equipped with manual hubs, place hubs in FREE position (Fig. 1).
5. Place transfer case in neutral.
6. Place transmission in neutral.
7. Place a locking device on the front steering wheel to hold wheels in a straight ahead position. NOTE: Do not use the steering column lock to lock wheels in a straight ahead position.
8. Do not exceed a speed of 80 km/h (50 mph) on smooth surface roads or 56 km/h (35 mph) on rough surface roads.

Bronco Rear Towing With T-Hooks

Refer to General Wrecker Towing Procedure in this part before attaching towing chains.

1. Insert T-hooks in T-hook slot in frame (Fig. 12).
2. Place sling crossbar under bumper.
3. Attach safety chains around rear axle inboard of leaf spring seat.
4. On vehicles equipped with automatic locking hubs, place hubs in AUTO position (Fig. 1). On vehicles equipped with manual hubs, place hubs in FREE position (Fig. 1).
5. Place transfer case in neutral.

6. Place transmission in neutral.
7. Place a locking device on steering wheel to keep steering.
NOTE: Do not use the steering column lock to lock the wheels in a straight ahead position.
8. Do not exceed a speed of 80 km/h (50 mph) on smooth surface roads or 56 km/h (35 mph) on rough surface roads.

F-100/F-150/F-250/F-350 (4x2) (4x4) Rear Towing With J-Hooks

Refer to General Wrecker Towing Procedure in this part before attaching towing chains.

1. Insert J-hook under axle outboard of spring seat (Fig. 13).
2. Place sling crossbar under bumper.
NOTE: A 4x4 wood block is required to be placed against the rear spring brackets on vehicles that are not equipped with a rear bumper. If the vehicle is also equipped with an underframe spare tire, the tire must be removed to allow installation of the wood block (Fig. 14).
3. Attach safety chains around axle inboard of the leaf spring seat.
4. On vehicles equipped with automatic hubs, place hubs in AUTO position (Fig. 1). On vehicles equipped with manual hubs, place hubs in FREE position (Fig. 1).
5. On 4x4 vehicles, place transfer case in neutral.
6. Place transmission in neutral.
7. Place a locking device on the steering wheel to keep wheels in a straight ahead position.
CAUTION: Do not use the steering column lock to lock the wheels in a straight ahead position.
8. Do not exceed a speed of 80 km/h (50 mph) on smooth surface road or 56 km/h (35 mph) on rough surface roads.

F-100—F-350 (4x2) (4x4) Rear Towing With T-Hooks

Refer to General Wrecker Towing Procedure in this part before attaching towing chains.

1. Insert T-hooks in T-hook slot in frame (Fig. 15).
2. Place sling crossbar under bumper.
NOTE: A 4x4 wood block is required to be placed against the rear spring brackets on vehicles not equipped with a rear bumper. If the vehicle is also equipped with an underframe spare tire, the tire must be removed to allow installation of the wood block (Fig. 16).
3. Attach safety chains around the axle inboard of the leaf spring seat.
4. On vehicles equipped with automobile hubs, place hubs in AUTO position (Fig. 1). On vehicles equipped with manual hubs, place hubs in FREE position (Fig. 1).

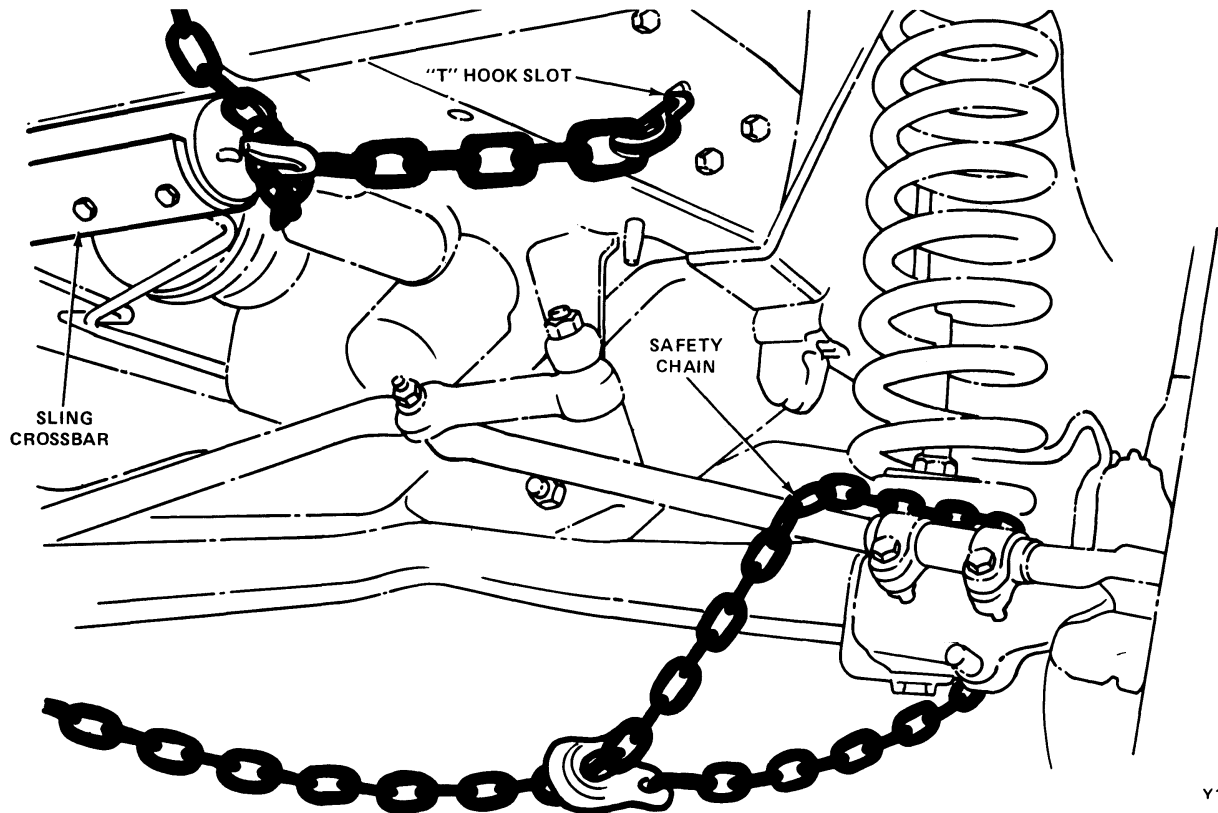


FIG. 10 Front Towing Connections—T-Hooks—E-100, E-150, E-250 and E-350

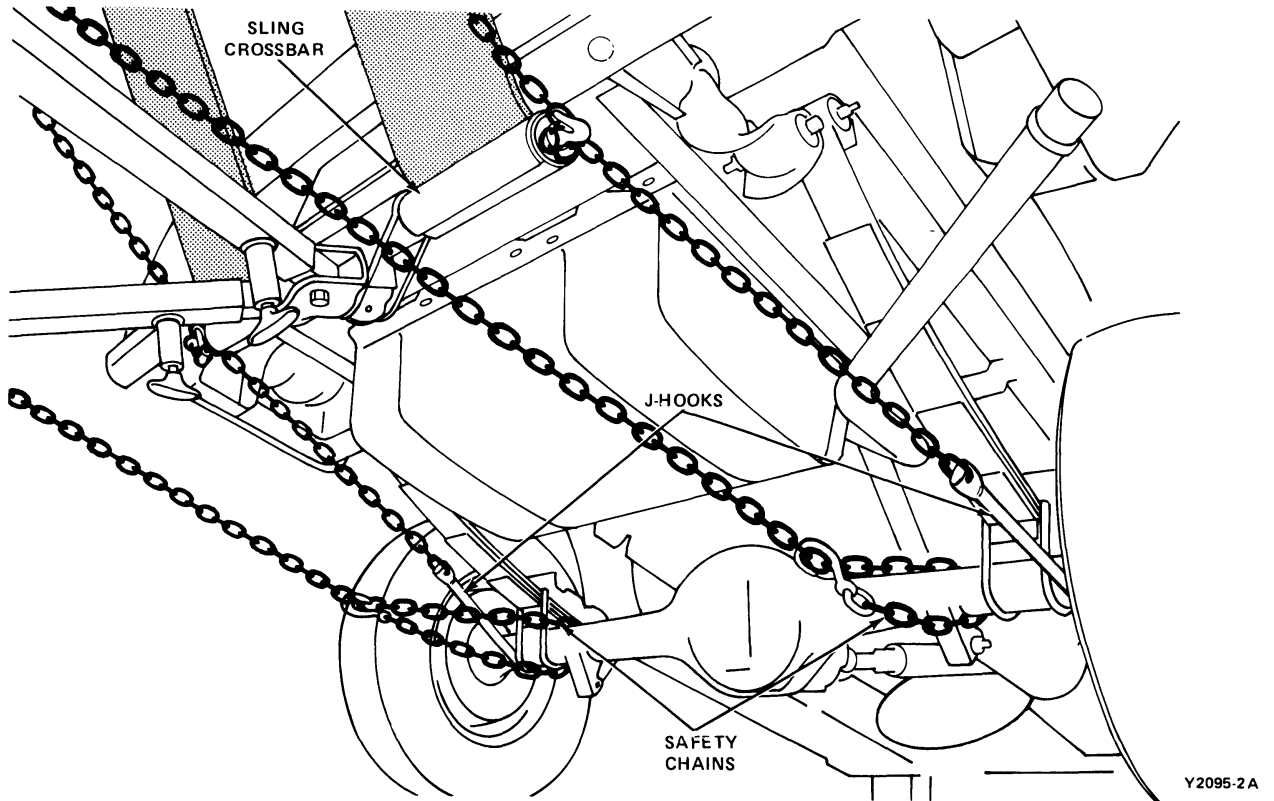


FIG. 11 Rear Towing Connections—J-Hooks—Bronco

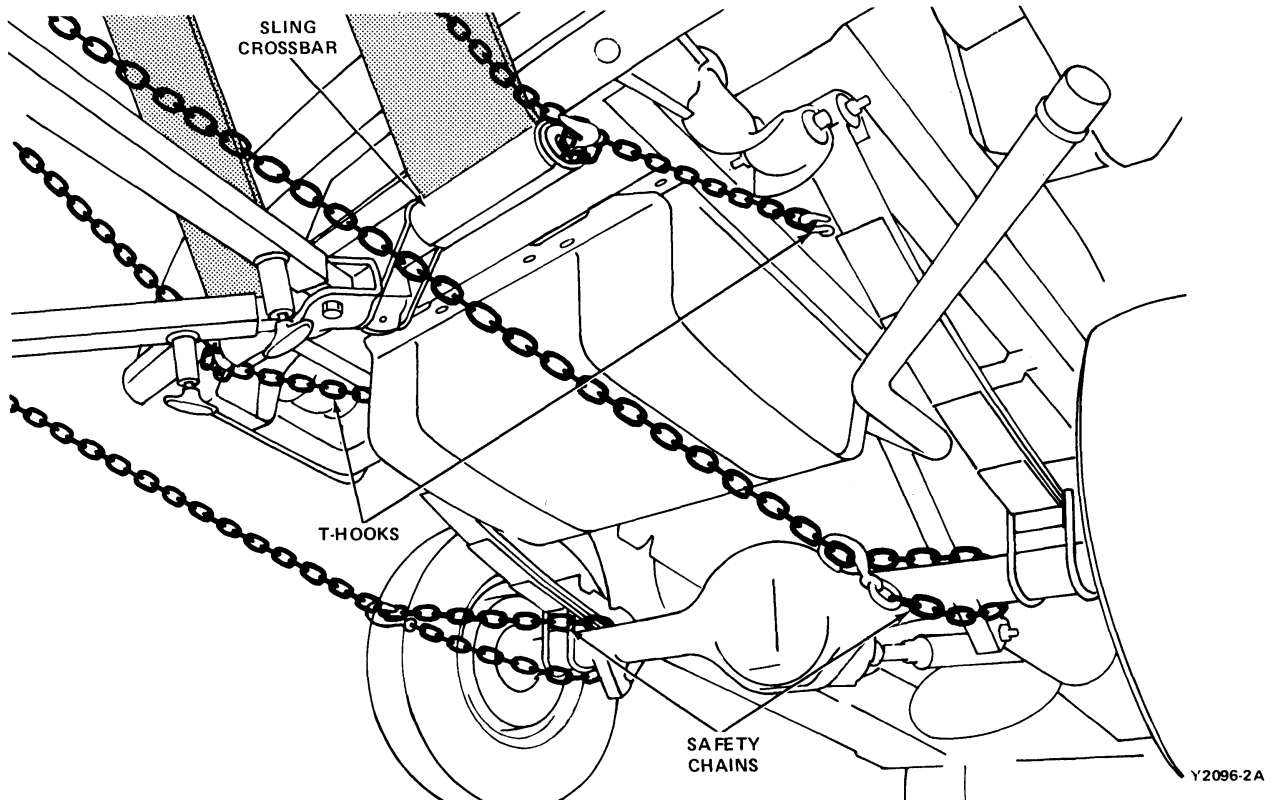


FIG. 12 Rear Towing Connections—T-Hooks—Bronco

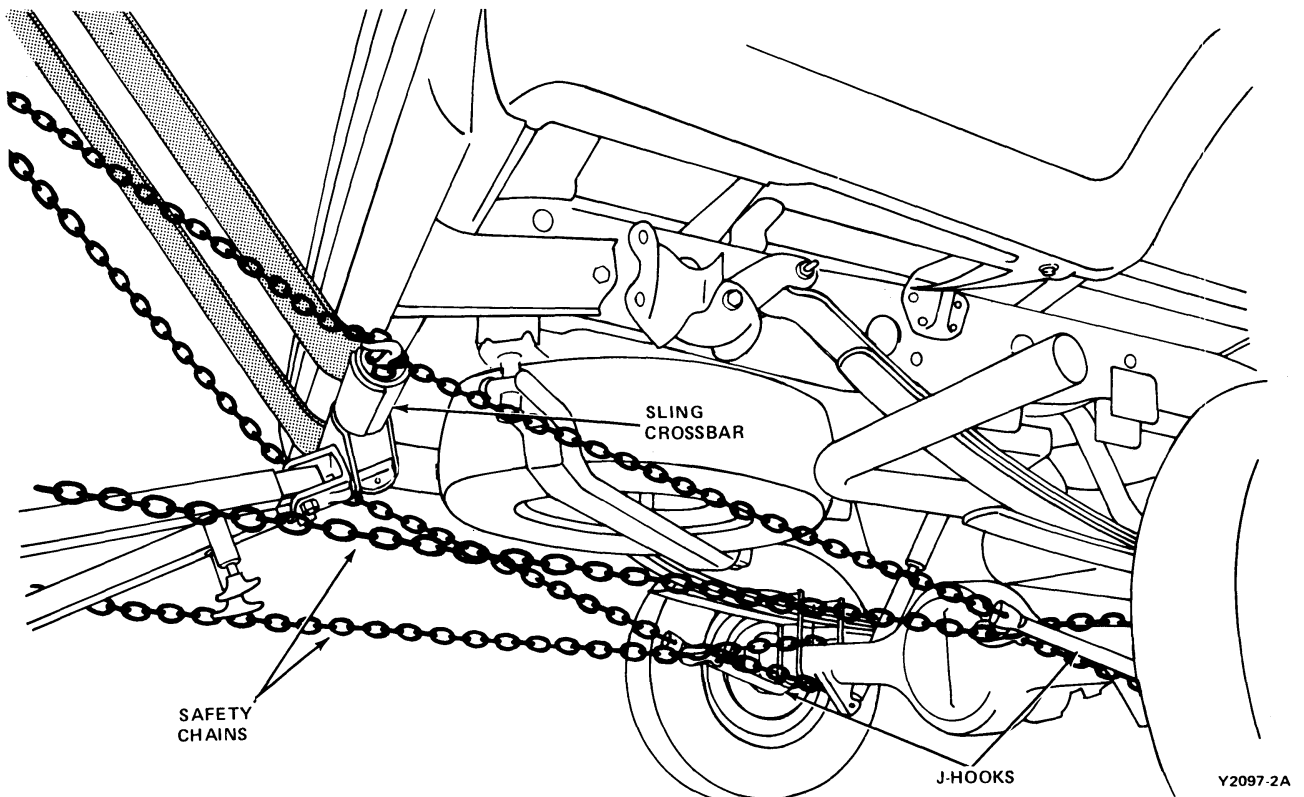


FIG. 13 Rear Towing Connections—J-Hooks—F-100, F-150, F-250 and F-350 (4x2 and 4x4)

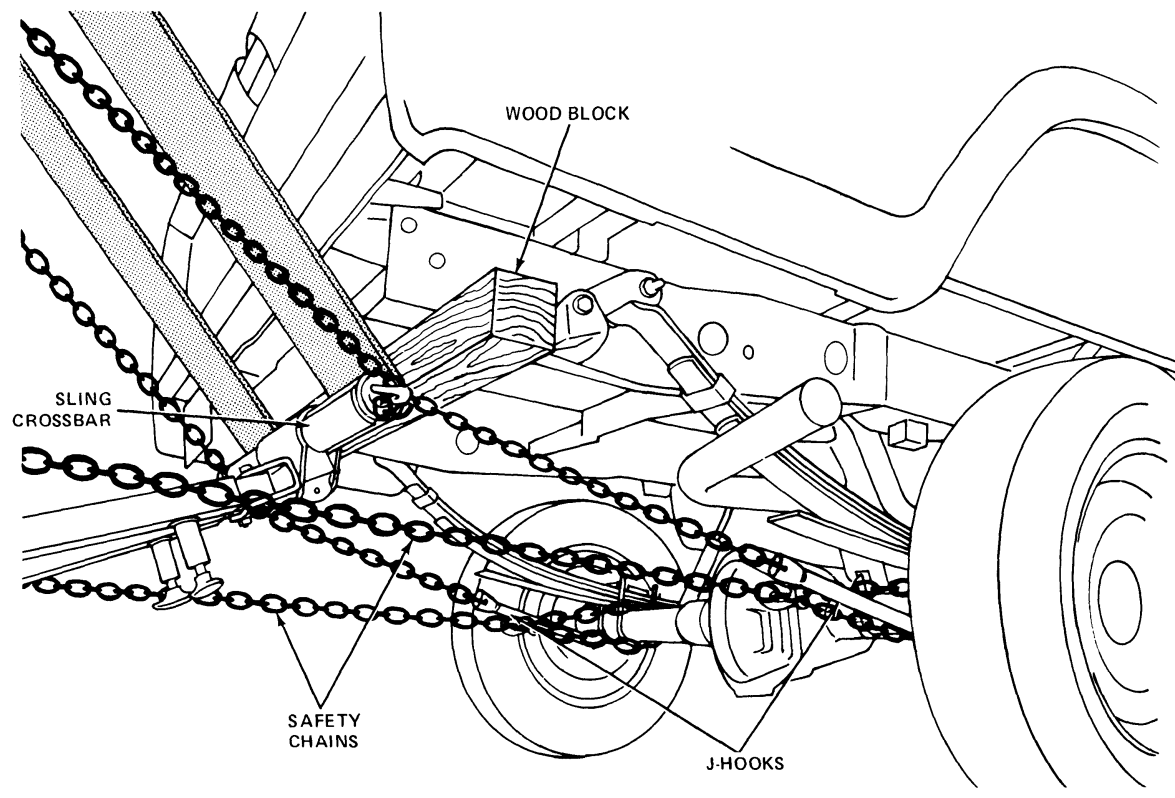


FIG. 14 Rear Towing Connections—J-Hooks—F-100, F-150, F-250 and F-350 (4x2 and 4x4)

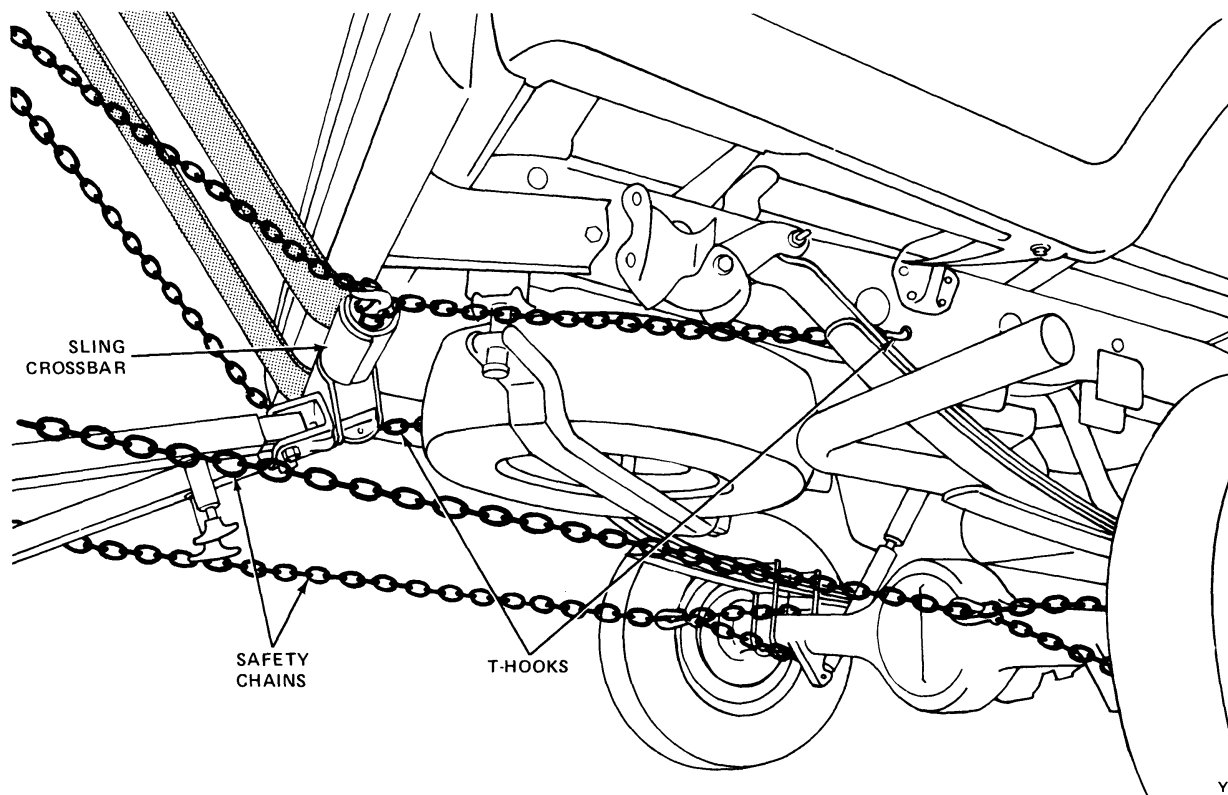


FIG. 15 Rear Towing Connections—T-Hooks—F-100, F-150, F-250 and F-350

5. On 4x4 vehicles, place transfer case in neutral.
6. Place transmission in neutral.
7. Place a locking device on the steering wheel to keep wheels in a straight ahead position.
CAUTION: Do not use steering column lock to keep wheels in a straight ahead position.
8. Do not exceed a speed of 80 km/h (50 mph) on smooth surface roads or 56 km/h (35 mph) on rough surface roads.

E-100/E-150/E-250/E-350 Rear Towing With J-Hooks

Refer to General Wrecker Towing Procedure in this part before attaching towing chains.

1. Attach J-hooks around the axle outboard of the leaf springs (Fig. 17).
2. Place a 4x4 wood block across frame rails behind the bumper. Position the sling crossbar against the 4x4 wood block rear face.
3. Attach separate safety chains around the frame rails or axle.
NOTE: This hookup is designated to minimize the risk of bumper damage during normal towing. It is important that sling crossbar be tight against the 4x4 wood block lower rear face to minimize rear bumper tow load.
4. Use a locking device to lock the steering wheel in

place to keep the front wheels in a straight ahead position.

NOTE: Do not use steering column lock to keep wheels in a straight ahead position.

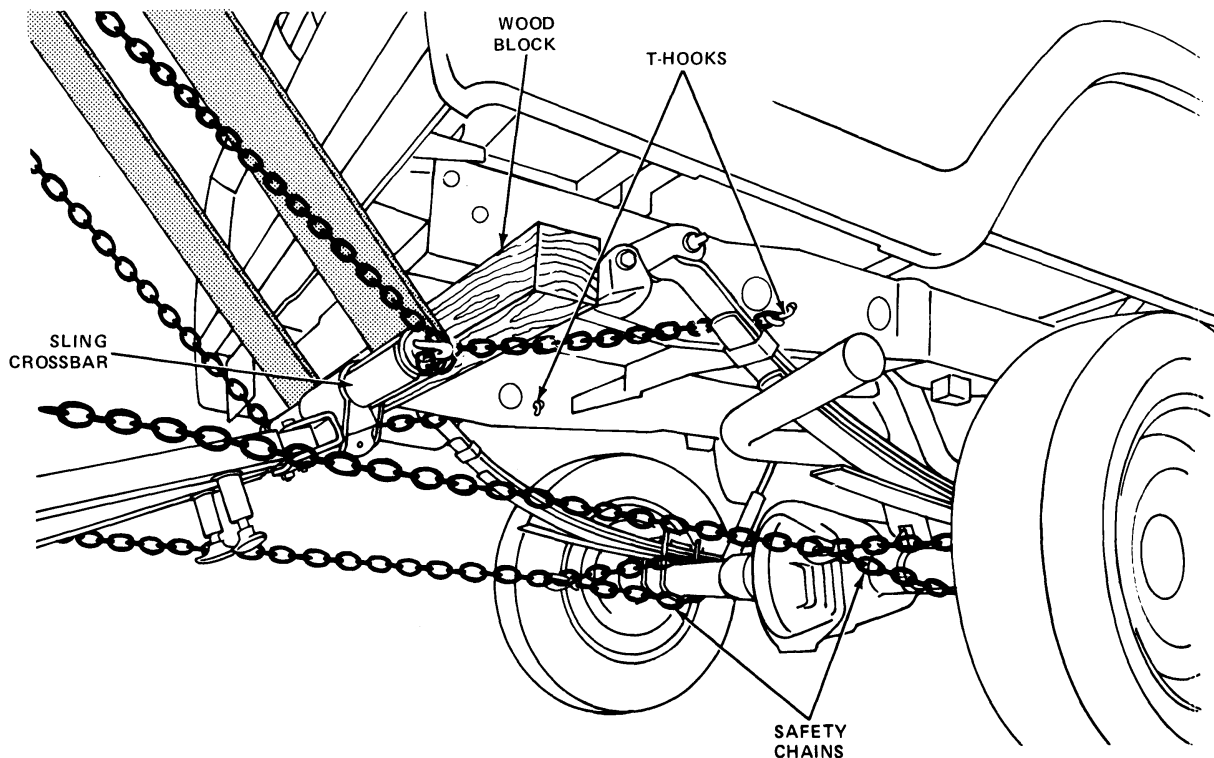
5. Do not exceed a speed of 80 km/h (50 mph) on smooth surface roads or 56 km/h (35 mph) on rough surface roads.

E-100/E-150/E-250/E-350 Rear Towing With T-Hooks

CAUTION: Do not use T-hooks on Econoline with 124 inch wheelbase.

Refer to General Towing Procedure in this part before attaching towing chains.

1. Insert T-hook in T-hook slot in frame (Fig. 18).
2. Place a 4x4 wood block across the frame rails at the bumper. Position sling crossbar against the 4x4 wood block rear face.
3. Attach separate safety chains around the frame rails or axle.
4. Use a locking device on the steering wheel to lock the front wheels in a straight ahead position.
NOTE: Do not use the steering column lock to lock the front wheels in a straight ahead position.
5. Do not exceed a speed of 80 km/h (50 mph) on smooth surface roads or 56 km/h (35 mph) on rough surface roads.



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FIG. 16 Rear Towing Connections—T-Hooks—F-100, F-150, F-250 and F-350

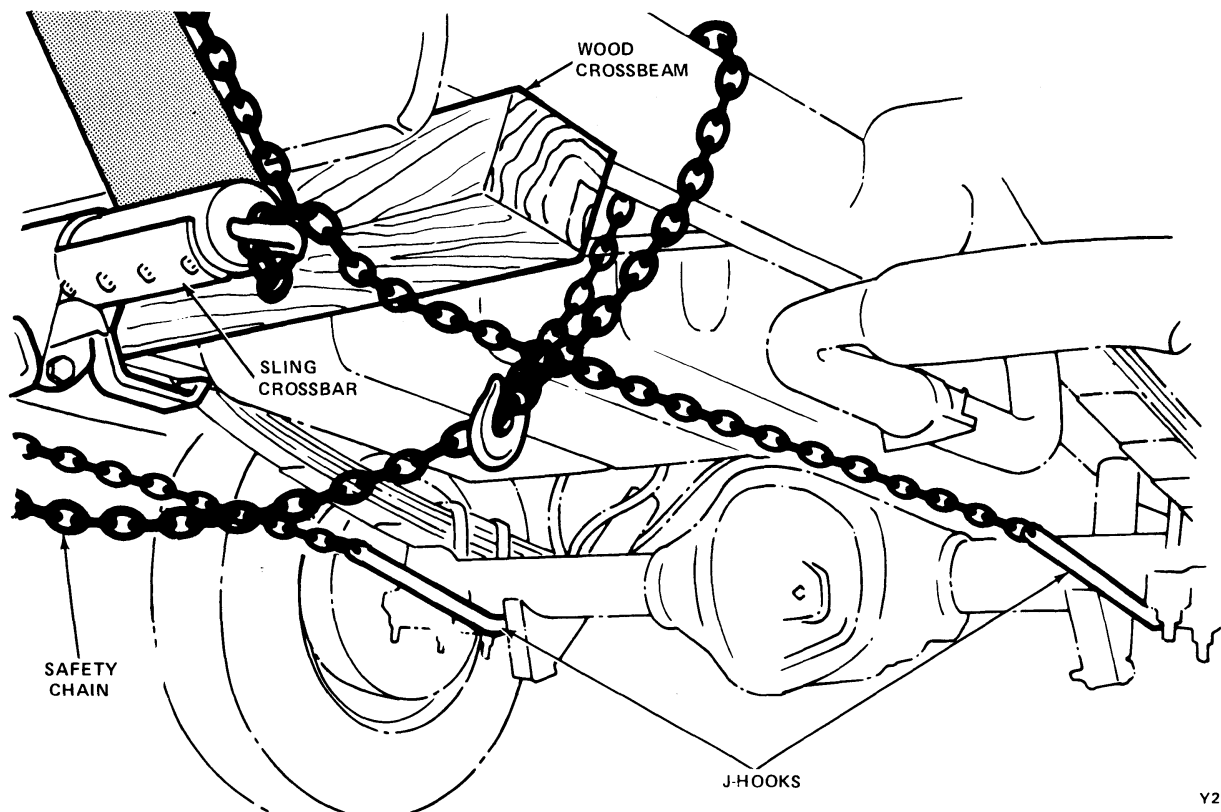


FIG. 17 Rear Towing Connections—J-Hooks—E-100, E-150, E-250 and E-350

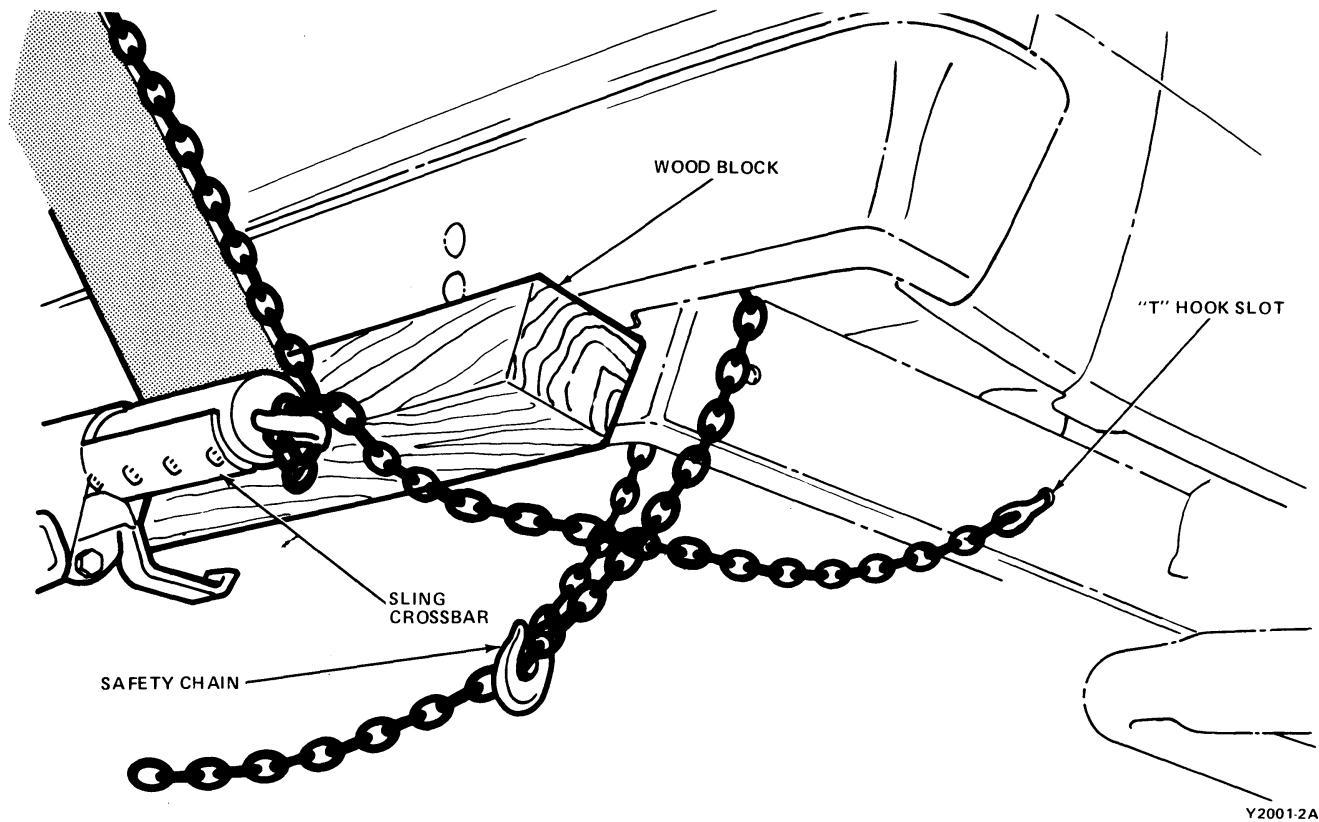


FIG. 18 Rear Towing Connections—T-Hooks—E-100, E-150, E-250 and E-350

Wheels and Tires

PART 50-11

APPLIES TO ALL MODELS

SUBJECT	PAGE	SUBJECT	PAGE
LUBRICATION		MAINTENANCE (Cont'd.)	
F-100 — F-350, E-100 — E-350	50-11-1	P-600	50-11-5
Medium and Heavy Vehicles	50-11-3	Inspect Tires and Check	
Repack Front Wheel Bearings	50-11-1	Air Pressure	50-11-5
MAINTENANCE		Rotate Wheels and Tires	50-11-5
Balance Wheels	50-11-6	Torque Wheel Nuts	50-11-6
Front Wheel Bearing Adjustment	50-11-5	PRE-DELIVERY	50-11-1
All Medium, and Heavy Trucks	50-11-5	SPECIFICATIONS	50-11-7
F-100 — F-350, E-100 — E-350	50-11-5		

PRE-DELIVERY

Refer to Part 50-02.

LUBRICATION

REPACK FRONT WHEEL BEARINGS

If bearing adjustment (Maintenance Section of this Part) did not eliminate looseness or rough and noisy operation, the hub and bearings should be inspected and re-packed with specified wheel lubricant (Part 50-03, Lubrication Charts and Lubrication Specifications). If bearing cups, cone and roller assemblies are worn or damaged, replace them.

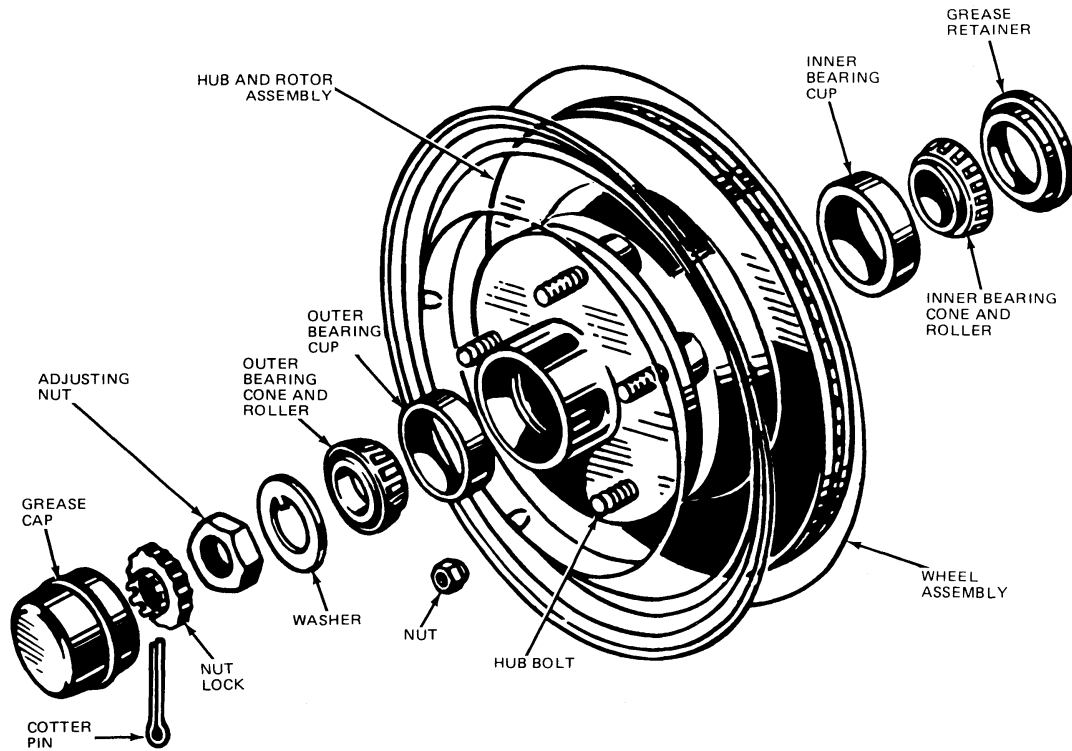
Sodium base grease is not compatible with lithium base grease and should not be intermixed. Do not lubricate bearings without first checking the type of original wheel bearing lubricant.

Refer to Part 50-02, Pre-Delivery and Maintenance Schedules for recommended intervals.

F100-F350, E100-E350

1. Raise the vehicle until the wheel and tire clear the floor and remove the wheel and tire from the hub and drum or hub and rotor. Remove the grease cap from the hub.
2. Remove the cotter pin, nut lock, adjusting nut and washer from the spindle (Fig. 1).
3. Remove caliper assembly (Refer to Group 12, Part 24 Disc Brakes—Light and Heavy Duty Sliding Caliper). The caliper can be suspended by wiring it above the hub and rotor. Be careful not to twist or strain the flexible brake lines.

4. Remove the outer bearing cone and roller. Pull the hub and drum assembly or hub and rotor assembly off the wheel spindle. If the drum will not remove easily, back off the brake shoe adjusting screw so that the shoes do not contact the brake drum. Remove and discard the grease retainer. **Note: Always replace the grease retainer whenever a hub and drum or hub and rotor assembly is removed.** Remove the inner bearing cone and roller from the hub. **Remove all traces of old lubricant from bearings, hubs, and axle spindle.**
5. Inspect the cups for scratches, pits or cracks. If the cups are worn or damaged, remove them with a drift. Clean the inner and outer bearing cones and rollers with solvent and dry them thoroughly. **Do not spin the bearings dry with compressed air.**
6. Inspect the cones and rollers for cracks, nicks, brinelling, or seized rollers.
7. Cover the spindle with a clean cloth and brush all loose dust and dirt from the brake assembly. **Remove the cloth from the spindle carefully to prevent dirt from falling on the spindle.**
8. Install the inner and outer bearing cups in the hub with the appropriate installing tool (Fig. 2). Be sure to seat the cups properly in the hub.
The cups will be properly seated when they are fully bottomed in the wheel hub. Pack the inside of the hub with the equivalent (Part 50-03). Fill the



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FIG. 1 Front Hub, Bearings and Grease Retainer—F-100 Through F-350 (4x2), E100-E350

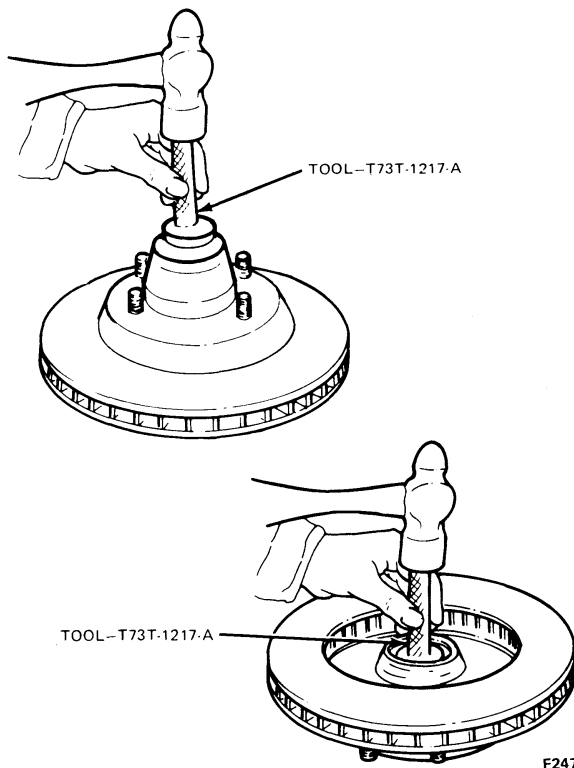


FIG. 2 Installing Bearing Cups—2-Wheel Drive

hub until the grease is flush with the inside diameters of both bearing cups. Pack the bearing cones and rollers with specified grease

ESA-M1C75-B or equivalent. Use a bearing packer for this operation such as Rotunda models 120011, 120072 or 120250 or equivalent. If a packer is not available, work as much lubricant as possible between the rollers and cages. Lubricate the cone surfaces with grease.

9. Place the inner bearing cone and roller in the inner cup and install a new grease retainer (Fig. 3) with the appropriate driving tool. Be sure that the retainer is fully bottomed. Install the hub and drum on the wheel spindle. Keep the hub centered on the spindle to prevent damage to the grease retainer or the spindle threads.

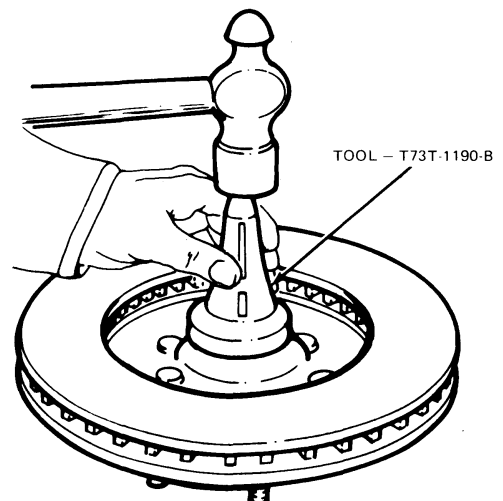


FIG. 3 Installing Grease Retainer

F1465-1B

10. Install the outer bearing cone and roller and the flat washer on the spindle, then install the adjusting nut.
11. Adjust the wheel bearing as outlined in this part.
12. Reinstall nut lock, cotter pin and grease cap.
13. Reinstall caliper, key, spring and caliper locking screw.

MEDIUM HEAVY VEHICLES

There are two basic types of wheel ends; disc wheel and hub and cast spoke wheel and rims (Fig. 4). The basic design of the hub bearings is the same in both hubs and cast spoke wheels, but differences in size exist between the various models. The outer bearing attaching parts differ according to front axle weight capacity as indicated in Fig. 4.

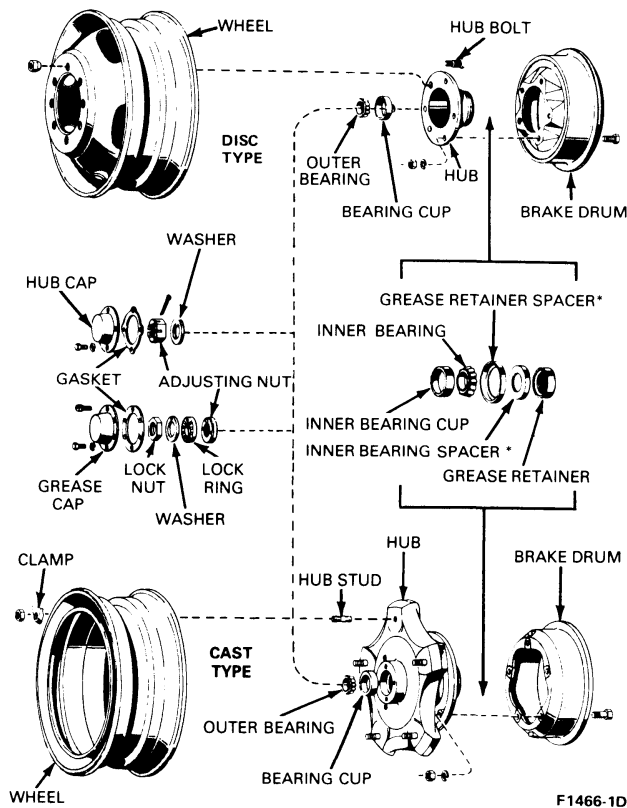


FIG. 4 Typical Front Hubs and Bearings

1. Raise the vehicle until the tires clear the floor and install safety stands to support the front axle. Remove the grease cap and gasket from the hub.
2. To check the wheel bearing adjustment, alternately push inward and outward on the tire. If any excessive looseness is felt or there is no end play, adjustment of the front wheel bearings is necessary.
3. With 5500, 6000, 7000, 9000, 12,000, 16,000, 18,000 or 20,000 pound capacity front axles, remove the cotter pin, adjusting nut and flat washer from the spindle. With 9000 or 12,000 pound capacity front axles, with hydraulic brakes remove the locknut, washer, locking ring and the adjusting nut and pin.
4. Inspect the condition of the spindle and nut threads to insure a free-running nut when re-assembling.
5. Remove the outer bearing cone and roller. Pull the hub and drum assembly off the spindle. Remove the inner bearing and seal using a brass drift. **Be careful not to damage the bearing cage.**
6. Remove all traces of old lubricant from the bearings, hubs and axle spindle. Inspect the cups for pitting, galling or unusual wear. If either cup is worn or damaged, remove it with a brass drift. Clean the inner and outer bearing cones and rollers with solvent and dry them thoroughly. **Do not spin the bearings dry with compressed air.**
7. Inspect the cones and rollers for pitting, galling or unusual wear. Particularly inspect the rollers for end wear and flat or rough spots. Replace all worn or damaged assemblies. It is recommended that the cone and roller assemblies and cups be replaced in sets.
8. Cover the spindle with a clean cloth and brush all loose dust and dirt from the brake assembly. Remove the cloth from the spindle carefully to prevent dirt falling on the spindle.
9. Install the inner and outer bearing cups in the hub with the appropriate tool (Fig. 5). Check for proper seating of the new bearing cups by trying to insert a 0.03 mm (0.0015 inch) feeler gauge between the cup and wheel hub. The feeler gauge should not enter.
10. Pack the inside of the hub with Lithium base wheel bearing grease (Part 50-03 Lubrication Charts and Lubrication Specifications). Fill the hub until the grease is flush with the inside diameters of both bearing cups. Pack the bearing cones and rollers with wheel bearing grease. Use a bearing packer for this operation. If a packer is not available, work as much lubricant as possible between the rollers and cages. Lubricate the cone surfaces with grease.
11. Place the inner bearing cone and roller in the inner cup and install a new grease retainer with the appropriate tool (Fig. 5). Be sure the retainer is fully bottomed. On all synthetic type seals, coat the seal lips with wheel bearing grease (Part 50-03 Lubrication Charts and Lubrication Specifications) before installing the hub and drum. On seals which are not coated on the outside diameter with sealer by the supplier, coat the grease seal bore in the hub with a thin coat of non-hardening sealer prior to installing the grease seal.
12. Install the hub and drum on the wheel spindle. **Keep the hub centered on the spindle to prevent damage to the grease retainer or the spindle threads.**
13. With 5500, 6000, 7000, 9000, 12,000, 16,000, 18,000 or 20,000 pound capacity front axles, install the outer bearing cone and roller and the flat washer on the spindle. Then, install the adjusting nut. With 9000 and 12,000 pound capacity front axles with hydraulic brakes, install the outer bearing cone and roller and the bearing adjusting nut.

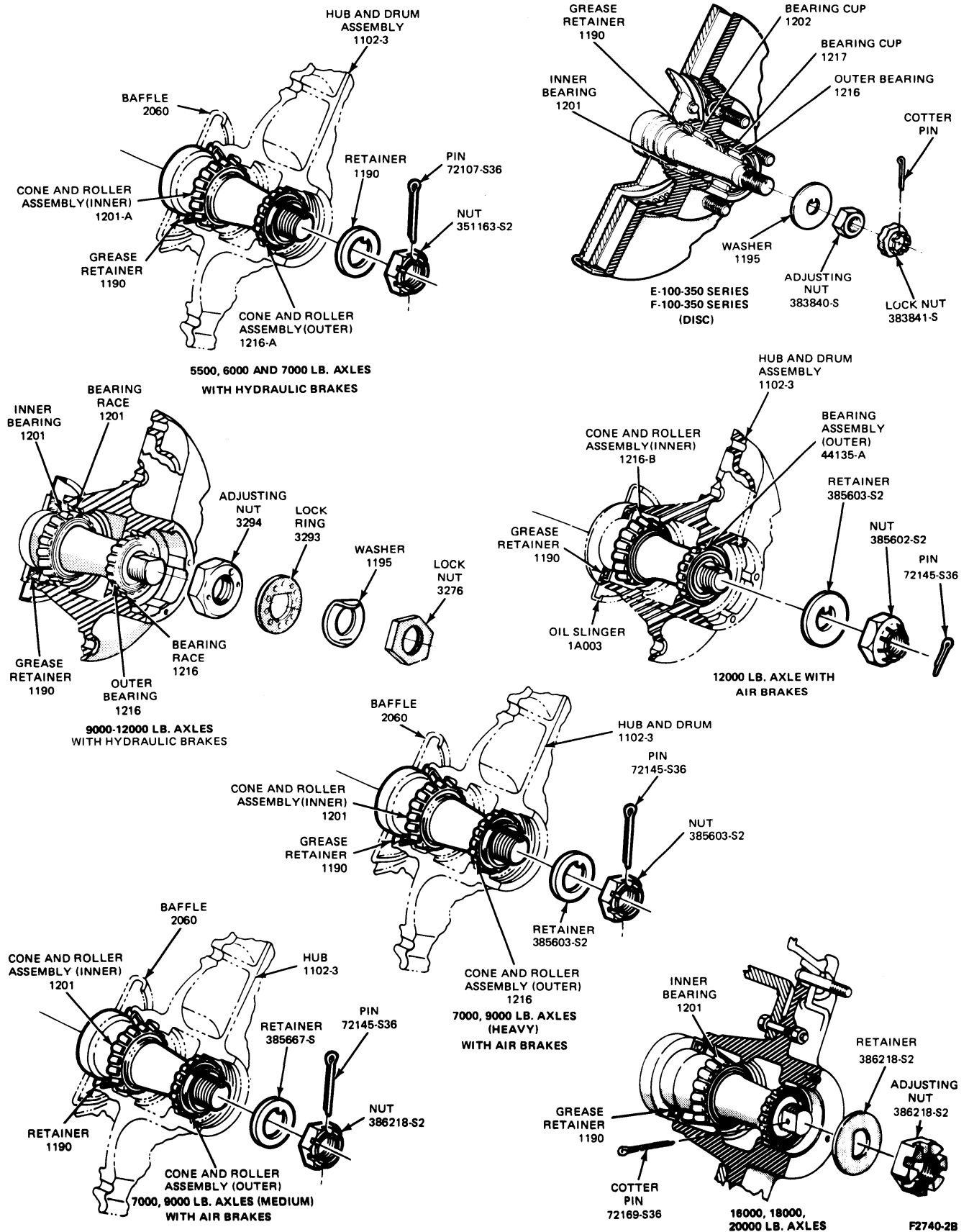


FIG. 5 Front Hub, Bearings and Grease Retainer

MAINTENANCE

INSPECT TIRES AND CHECK AIR PRESSURE

Remove all stones, nails or other objects that may be wedged in the tread grooves. Check for holes, cuts or bruises in tread of side wall that may permit air leakage. Make necessary repairs. If internal damage is suspected, remove tire from the wheel or rim for further inspection, and repair or replace if necessary.

Check tire valve for air leaks and replace if necessary. If cap is missing, replace it.

The tires should be checked frequently to be sure air pressure agrees with specifications for the tire and vehicle model.

ROTATE WHEELS AND TIRES—LIGHT TRUCKS

Check your tires occasionally for wear. Your tires will last longer if you have them rotated when uneven wear is noticed. Only tires of the same size, ply rating or load range should be cross-changed or rotated.

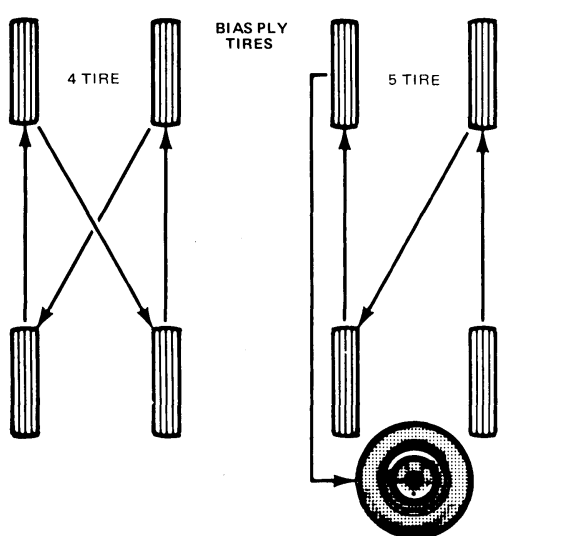
Rotate bias ply tires as shown. If your truck is equipped with radial ply tires, rotate them from front to rear as shown in Fig. 6. **Do not use any other method of rotation.**

Dual tires should be matched so that the tire diameters are within 6.35 mm (1/4 inch) of each other with the small diameter on the inner wheel to conform to the road. Tighten wheel stud nuts to specifications.

FRONT WHEEL BEARING ADJUSTMENT

When the wheel is off the ground, grasp tire at sides and alternately push inward and pull outward on the tire. If any looseness is felt, adjust the wheel bearing as described.

After adjusting, check front wheel rotation. If the wheel rotates freely with no noticeable end play, install the grease cap and hub cap; if loose or rough, inspect cones, rollers and cups and replace or repack as necessary.



F-100—F-350 (4X2) AND E-100—E-350

1. Remove the hub cap or wheel cover, wheel and tire assembly, disc brake caliper and pads (Refer to Part 12-24 Disc Brakes—Light and Heavy Duty Sliding Caliper), dust cap, locknut and cotter pin.
2. Tighten wheel retention nut (Fig. 1) to 30-33 N·m (22-25 ft-lbs) while rotating the disc brake rotor in the opposite direction.
3. Back off the wheel retention nut 1/8 turn and install retainer and cotter pin without additional movement of the wheel nut.
4. Re-install dustcap, caliper, pads and wheel and tire assembly.

ALL MEDIUM AND HEAVY TRUCKS

Single Nut With Cotter Pin (5500, 6000, 7000, 9000, 12,000 Pound Front Axles)

1. While rotating the wheel, tighten the adjusting nut to 95-135 N·m (70-100 ft-lbs) to seat the bearings.
2. Back off the adjusting nut 180 degrees (one half turn).
3. Hand tighten the adjusting nut finger tight (1.5-2.0 N·m or 13-17 in-lbs) while moving the top part of the tire in and out.
4. If the cotter pin hole lines up with a castellation in the nut, insert and secure a new cotter pin. If they do not line up, back off the adjusting nut to align a castellation with the first available cotter pin hole. Final bearing adjustment must provide 0.025-0.254 mm (0.001-0.010) end play.
5. Install the gasket and grease cap and adjust the brakes. **The final adjustment must not result in a preloaded bearing.**

Single Nut with Cotter Pin (16,000, 18,000 and 20,000 Pound Front Axle)

1. While rotating the wheel in both directions, tighten the adjusting nut to 136-169 N·m (100-125 ft-lbs) to seat the bearings.

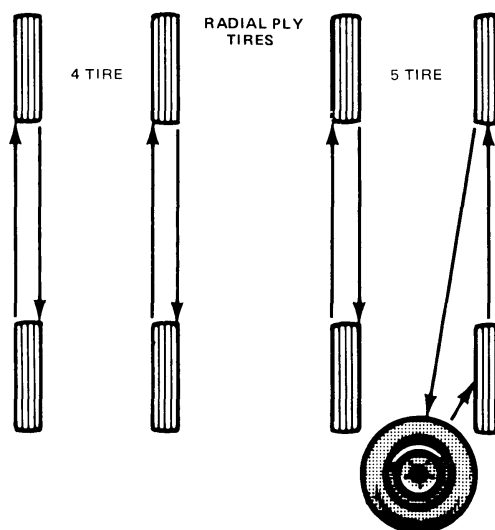


FIG. 6 Tire Rotating Diagram

2. Back off the adjusting nut one complete turn (Fig. 5).
3. Again while rotating the wheel in both directions, re-tighten the adjusting nut to 55-74 N•m (40-55 ft-lbs).
4. Back off the adjusting nut if necessary to align the nut castellations with the first available cotter pin hole.
5. Using the same cotter pin hole as a reference point, back off the adjusting nut **one additional castellation** to allow the wheel to rotate freely within the limits of 0.025-0.254 mm (0.001 to 0.010 inch) end play.
6. Insert and secure the cotter pin.
7. Install the gasket and grease cap and adjust the brakes. **The final adjustment must not result in a preloaded bearing.**

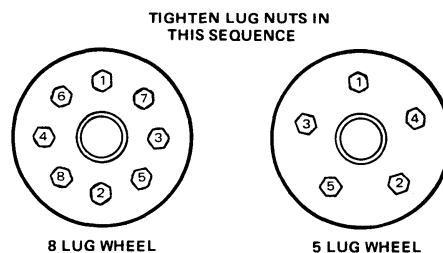
Double Nut with Lock Ring (9000 and 12,000 Pound Front Axle)

1. While rotating the wheel in both directions, tighten the adjusting nut to 136-169 N•m (100-125 ft-lbs) to seat the bearing.
2. Back off the adjusting nut one complete turn.
3. Again while rotating the wheel in both directions, re-tighten the adjusting nut to 55-74 N•m (40-55 ft-lbs).
4. Back off the adjusting nut to obtain an initial 0.101-0.254 mm (0.004-0.010 inch) end play between the wheel hub and spindle.
5. Install the lock ring making sure the adjusting nut dowel is inserted into the lock ring.
6. Install the outer washer and locknut. Tighten to 136 N•m (100-150 ft-lbs).
7. Re-check the end play (final limit 0.025-0.254 mm 0.001 to 0.010 inch). Readjust if necessary.
8. Bend the washer outward to lock the outer nut in position.
9. Install the gasket and grease cap and adjust the brakes. **The final adjustment must not result in a preloaded bearing.**

TORQUE WHEEL NUTS

It is important that wheel stud nuts and clamps be tightened alternately and evenly so that the lateral or side runout of the wheel does not exceed one-eighth

inch on front wheels or one-quarter inch on dual rear wheels. Position the wheel and tire on the axle studs, and install the lug nuts with the beveled end inward. Tighten the lug nuts. Always tighten alternate lug nuts to draw the wheel evenly against the hub and drum (Fig. 7).



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FIG. 7 Lug Nut Tightening Sequence

On dual wheels, back off the outer nut before tightening the inner stud. Then tighten outer nut. Some dual wheels are alternately flared inward and outward. These surfaces must be mated when wheels are mounted.

Note: On E-350 and F-350 vehicles equipped with dual rear wheels, a locating pin is pressed into each rear hub to assure positive dual rear wheel alignment.

Tighten all stud nuts to the recommended torque for the vehicle and wheel type (refer to the Specifications at the end of this Part).

Following 804 Km (500 miles) of new vehicle operation or after the lug nuts or clamp nuts have been loosened for any reason, the nuts must be re-tightened to specified torque.

BALANCE WHEELS

Refer to the instructions provided by the wheel balancer manufacturer.

Make certain that the brakes are not dragging, before attempting to spin the wheels.

SPECIFICATIONS

WHEEL TORQUE LIMITS — F-100-F-350, E-100-E-350, BRONCO

Model	Nut Size	Range (ft-lbs)	Nominal (ft-lbs)	Torque N•m	Nominal N•m
E-100, E-150					
F-100 (4x4), Bronco (Std. Wheel)		65-115	90	88-156	122
F-250-350 (4x4), Bronco	1/2-20	65-115	90	88-156	122
E-250 (Std. Wheel) (w/Single Rear Wheels)	1/2-20	65-115	90	88-156	122
F-350, E-350 w/Single Rear Wheels	9/16-18	115-175	145	156-237	196
F-350 (w/Dual Wheels and 7400-lb. Axle)	9/16-18	175-260	220	237-353	298
E-350 (w/Dual Rear Wheels)	9/16-18	175-260	220	237-353	298

WHEEL TORQUE LIMITS — 600 THRU 9000 SERIES

Wheel Type	Stud Size	Torque Limits	
		(ft-lb)	N•m
Disc	3/4-16	450-500	611-677
Disc	1-1/8-16	450-500	611-677
Cast	3/4-10	220-260	299-352

CY1397-1H

Brakes

PART 50-12

APPLIES TO ALL MODELS

SUBJECT	PAGE	SUBJECT	PAGE
LUBRICATION		MAINTENANCE (Cont'd.)	
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PRE-DELIVERY

Refer to Part 50-02.

LUBRICATION

PARKING BRAKE CABLE AND LINKAGE

Raise vehicle on a hoist, clean all old lubricant from the cable, and apply specified grease sparingly. See Part 50-03 Lubrication Charts and Lubricant Specifications.

Lubricate all clevis pins and pivot points with SAE 10W engine oil.

BRAKE PEDAL PIVOT SHAFT

On all air brake equipped vehicles, apply Lubricant ESW-M1C75B or equivalent to the brake pedal shaft.

AIR BRAKE FOOT CONTROL VALVE

Lubricate the treadle pivots, roller and plunger face. Use only specified lubricant (Part 50-03 Lubrication Charts and Lubricant Specification).

MAINTENANCE

AIR PRESSURE BUZZER AND GAUGE OPERATION

Operate brakes to drop pressure below 275 kPa (40 psi). With engine running, buzzer should sound and continue sounding until pressure builds to 400-448 kPa (58-65 psi).

AIR COMPRESSOR GOVERNOR OPERATION

With engine running, the instrument panel gauge should show governor cut-out at 793-861 kPa (115-125 psi), and cut-in at 655-689 kPa (95-100 psi). Adjust if required.

HYDRAULIC BRAKE MASTER CYLINDER FLUID LEVEL

The level should be between full and 1/4 inch below the top of the reservoir on both single and dual master cylinders. Use only specified brake fluid. Refer to Lubricant Chart in Part 50-03 Lubrication Charts and Lubricant Specifications.

HYDRO-MAX BRAKE BOOSTER

The Hydro-Max brake booster uses brake fluid in the master cylinder and power steering fluid in the pump system. These fluids are not compatible. Do not mix. Failure to observe all precautions preventing contamination of either system will result in deterioration of rubber parts leading to reduced brake performance and eventual failure.

HYDRAULIC BRAKE SYSTEM

Check lines and hoses for fluid leaks and loose connections, kinks and interference with adjacent moving or frictional components. Check brake booster and master cylinder for vacuum and fluid leaks. Tighten and correct as required.

PARKING BRAKE BURNISHING—TRUCKS EQUIPPED WITH TRANSMISSION MOUNTED PARKING BRAKES

600—900 SERIES

The following burnishing procedure is required to be performed on new vehicles or whenever the parking brake lining and/or drum is replaced.

VEHICLES WITH ORSCHELN LEVER

1. With parking brake released, turn the handle knob until a force of at least 94 N·m (70 lbs) is required to apply the brake (over center position of the lever).
2. Make four stops from 32 Km/h (20 mph) on a dry hard surface road, using only the parking brake to stop the vehicle. After each stop, release the brake and drive the vehicle at 32 Km/h (20 mph) for 4 Km (2.5 miles).
3. Readjust the lever handle so that a force of approximately 122 N·m (90 lbs) is required to pull the lever over center.

VEHICLES WITH CONVENTIONAL LEVER

Make four stops from 32 Km/h (20 mph) on a dry hard surface road, using only the parking brake to stop the vehicle and pulling on the brake lever with a force of 94 N·m (70 lbs). After each stop, release the brake and drive the vehicle at 32 Km/h (20 mph) for 4 Km (2.5 miles).

AIR BRAKE SYSTEM

Check for evidence of leakage at all fittings. Inspect lines for kinks and interference with adjacent moving or frictional components. Make sure there is as much clearance as possible between air brake and exhaust systems. Tighten and correct as required.

CAUTION: DURING MAINTENANCE AND REPAIR, PROTECT NYLON AIR BRAKE LINES FROM EXTERNAL HEAT, ACIDS AND ABRASION THAT COULD DAMAGE LINES.

BRAKE OPERATION

Check foot brake pedal height before road testing. Then check and correct the following, as required: Pull in either direction, harshness or noise, excessive pedal effort, or spongy feel. Avoid sudden hard stops—make slow, gradual stops. On all F100-350, Bronco E100-350, it may be necessary to make a few reverse stops to fully adjust the rear brakes.

CHECK AIR BRAKE AIR RESERVOIR

Check the connections to the air brake reservoir for leaks, and be sure the drain cock is closed and reservoir is securely attached. Make any necessary corrections.

INSPECT BRAKE LININGS, DRUMS, ROTORS, CALIPERS AND TORQUE BRAKE BACKING PLATE ATTACHING BOLTS

On all truck series, be sure that the parking brake handle is fully released before making any brake adjustments.

Raise all four wheels.

1. On vehicles equipped with front disc brakes, remove the shoe and linings as described in Part 12-24 Disc Brakes—Light and Heavy Duty—Sliding Caliper.
2. Measure the thickness of the brake lining. If the lining thickness at any point on the assembly is less than 0.030 above the rivets, or backing plate or if the lining shows evidence of brake fluid or oil contamination that is causing a brake pull, replace all four shoe and lining assemblies.
3. Remove the hub and rotor assembly and check the condition of the inner grease seal and the amount and condition of the wheel bearing lubricant. Add lubricant to the outer bearing as required. If the inner bearing requires additional lubricant, or if the inner seal has been damaged, remove the inner seal, add lubricant as required, and install a new inner seal. If the lubricant or inner seal does not require maintenance do not remove the inner seal. Re-install the hub and rotor assembly and adjust the wheel bearing end play as described in Part 11-10, Wheels, Hubs and Bearings—Front (Except Front Drive).
4. Check the caliper. If it is cracked replace it. If the caliper is leaking around the dust boot, remove caliper and repair the leak.
5. Check brake hoses for signs of cracking, leaks or abrasion. Replace them, if necessary.

On vehicles equipped with drum brakes:

1. Remove one of the front brake drums, and inspect the drum and linings (the wheel bearings should be inspected at this time and re-packed if necessary). Do not let oil or grease touch the drum or linings. If the linings are worn to within 0.79 mm (1/32 inch) of the rivet heads, replace or re-line both sets (primary and secondary) on the front or rear wheels. **Do not replace one lining only, or one wheel set under any circumstances. Both front wheel sets or both rear wheel sets should be replaced whenever a respective lining or shoe is worn or damaged.** If the drum braking surface is excessively scored, re-finish it.

Then check rear brake linings and replace, if necessary.

2. Before relining a brake shoe, inspect the shoe for distortion, cracks, or looseness between the rim and web. If one of these conditions exists, replace the shoe. **Do not attempt to repair a damaged brake shoe.**
3. Check the front brake anchor pin nut with a wrench (on brake assemblies with an adjustable anchor pin). If the bolt is loose, tighten it to 109-134 N·m (80-100 ft-lbs) torque.
4. Check the attaching bolt torque of the brake

backing plate. Tighten to specifications listed at the end of this Part.

CLEAN FRAME MOUNTED VACUUM BOOSTER AIR CLEANER

C-SERIES (FRAME MOUNTED)

Remove the ceramic filter element and wash it in a suitable cleaning solvent, (not gasoline). Use an air hose to dry the element. If the filter element is too dirty to clean, replace the element.

Install the filter and lower filter housing. Hand tighten the lower housing.

F-B AND L-SERIES (IN-CAB AND COWL MOUNTED)

Remove the filter and wash it in a suitable cleaning solvent. Use an air hose to dry the element. If the filter is too dirty to clean, replace the element, housing and sleeve as an assembly. Install the filter assembly.

CLEAN INTERNAL EXPANDING SHOE PARKING BRAKE (WITHOUT DUST SHIELD)

Remove the universal joint assembly and drive shaft from the parking brake drum. Remove the drum from the transmission. Clean the brake shoes and drum with a scraper and air hose. Install the brake drum and connect the universal joint and drive shaft.

BRAKE SHOE ADJUSTMENT

Adjust the brake shoes when the brake drums are at normal room temperature. If the shoes are adjusted when the drums are hot and expanded, they may drag as the drums cool and contract.

Brake adjustment re-establishes the brake lining-to-drum clearance and compensates for normal lining wear.

Adjustment procedures for each type of brake assembly are given below:

Only minor adjustments are covered in this Part. Refer to Body, Chassis and Electrical book of this manual for major adjustment procedures.

SELF ADJUSTING BRAKES—F-100-350, E-100-350 REAR, BRONCO, AND F-150—F-250 (4X4) MANUAL ADJUSTMENT

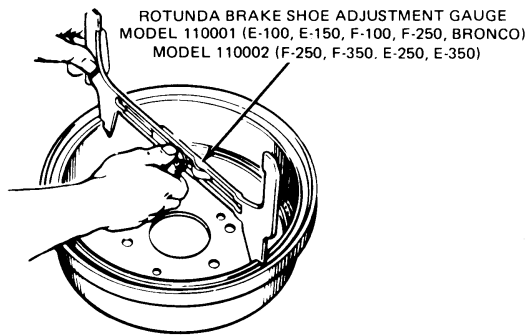
The brake shoes are automatically adjusted when the truck is driven in reverse and the brakes applied. **A manual adjustment is required only after the brake shoes have been relined or replaced.** The manual adjustment is performed while the drums are removed, using the tool and the procedure detailed below.

When adjusting the rear brake shoes, check the parking brake cables for proper adjustment. Make sure that the equalizer operates freely.

To adjust the brake shoes:

1. Use Rotunda Tool HRE 8650, (Fig. 1) Rotunda Brake Shoe Adjustment Gauge (model 110001 or equivalent for E100, E150, F100, F150 and Bronco, or model 110002 or equivalent for F250, F350, E250 and E350) or equivalent and adjust the inside diameter of the drum braking surface.

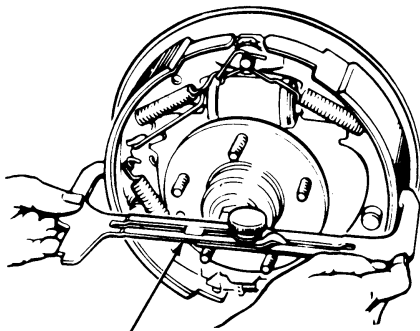
adjust to the inside diameter of the drum braking surface.



H1411-1F

FIG. 1 Measuring Drum

- Reverse the tool as shown in Fig. 2 and adjust the brake shoes to touch the gauge. **The gauge contact points on the shoes (Fig. 2) must be parallel to the vehicle with the center line through the center of the axle.** Hold the automatic adjusting lever out of engagement while rotating the adjusting screw, to prevent burring the screw slots. Make sure the adjusting screw rotates freely. If necessary, lubricate the adjusting screw threads with a thin, uniform coating of multi-purpose lubricant, Ford specification ESA-M1C75-B or equivalent.



ROTUNDA BRAKE SHOE ADJUSTMENT GAUGE
MODEL 110001 (E-100, E-150, F-100, F-150, BRONCO)
MODEL 110002 (F-250, F-350, E-250, E-350)

H1412-1F

FIG. 2 Measuring Shoes

- Apply a small quantity of C1AZ-19590-B grease or equivalent to the points where the shoes contact the backing plate, being careful not to get the lubricant on the linings.
- Install the drums. Install the retaining nuts and tighten securely.
- Install the wheels on the drums and tighten the mounting nuts to specification.
- Complete the adjustment by applying the brakes several times while backing the vehicle.
- After the brake shoes have been properly adjusted, check the brake operation.

SELF ADJUSTING BRAKES-REAR—600-900 SERIES

The brake shoes are automatically adjusted when the vehicle is driven in reverse and the brakes applied sharply several times. **The manual adjustment is required only after the brake shoes have been relined or replaced.**

To adjust the brakes refer to the procedure covered in Part 12-08, Drum Brakes—Dual Cylinders, Dual Pistons under Adjustments.

SELF ADJUSTING BRAKES—TWO-CYLINDER FRONT 600-900 SERIES

Manually adjust two-cylinder front brakes using the hex-head, self-locking cam adjusters. Subsequent adjustment is automatic. For manual adjustment:

To adjust the brakes refer to the procedure in Part 12-09, Drum Brakes—Dual Cylinders, Single Piston (Wagner) under Adjustments.

SELF ADJUSTING BRAKES—ONE-CYLINDER FRONT 600-800 SERIES

The brake shoes are automatically adjusted when the vehicle is driven in reverse and the brakes applied. A manual adjustment is required only after the brake shoes have been relined or replaced.

- With the vehicle raised, check the front brakes for drag by rotating the wheels.
- Remove the cover from the adjusting hole at the bottom of the brake backing plate, and turn the adjusting screw inside the hole to expand the brake shoes until a slight drag is felt at the wheel.
- Back off the adjusting screw seven notches.
- Complete the adjustment by applying the brakes several times while backing the vehicle.
- After the brake shoes have been properly adjusted, check the operation of the brakes by making several stops while operating in a forward direction.

AIR BRAKE SERVICE

For air brake chamber service procedures, refer to Group 12—Brakes Medium—Heavy Truck.

ADJUST PARKING BRAKE

VEHICLES EQUIPPED WITH ORSCHELN LEVER

The Orscheln parking brake is the over center locking type. It is adjusted (while in the released position) by turning the lever knob. When properly adjusted, it pulls over center with a distinct click. No other adjustment is normally required. Refer to Parts 12-77, Parking Brake-External Band, Transmission Mounted and 12-79, Parking Brake-Internal Shoe, Transmission Mounted in Volume 1 for additional information.

CABLE ACTUATED REAR WHEEL PARKING BRAKE—F-100-F-350, E-100-E-350, AND BRONCO

Adjust the service brakes before attempting to adjust the parking brake cables.

Initial Adjustment

(This procedure is used when a new tension limiter is installed).

1. Fully depress the parking brake pedal.
2. Grip the tension limiter bracket to prevent it from spinning. Tighten the equalizer nut to 63.5 mm. (2 1/2 inches) travel up the rod.
3. Check to make sure the cinch strap has slipped .44.45 mm. (1 3/4 inches) or less must remain. (Fig. 3).

Field Adjustment

(This procedure must be used to correct a slack system if a new tension limiter is not installed).

1. Make sure brake drums are cold for correct adjustment.
2. Position the parking brake pedal to the fully released position.
3. Grip the tension limiter bracket to prevent it from spinning and tighten the equalizer nut six full turns past its original position.
4. Fully depress pedal and check for proper rear cable tension. (Refer to Specifications at the end of this part.) If tension is low, repeat steps 2 and 3.
5. Release parking brake and check for wheel rear wheel drag.
6. If rear wheel brake drag is noted after adjustment on F-250, F-350, E-250 and E-350, the rear drums must be removed after the service and parking brakes have been adjusted. Check the clearance between the parking brake lever and the cam plate (Fig. 4). The clearance should be 0.38 mm (0.015 inch) with the brakes fully released. If the clearance is not within specifications, readjust the parking brake cable.

NOTE: The tension limiter will reset parking brake tension anytime the system is disconnected provided the distance between the bracket and cinch strap hook is reduced during adjustment. When the cinch strap hook contacts the bracket, the system tension will increase significantly and overtensioning may result.

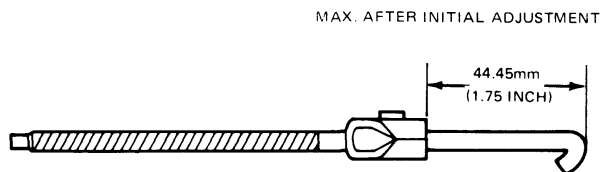


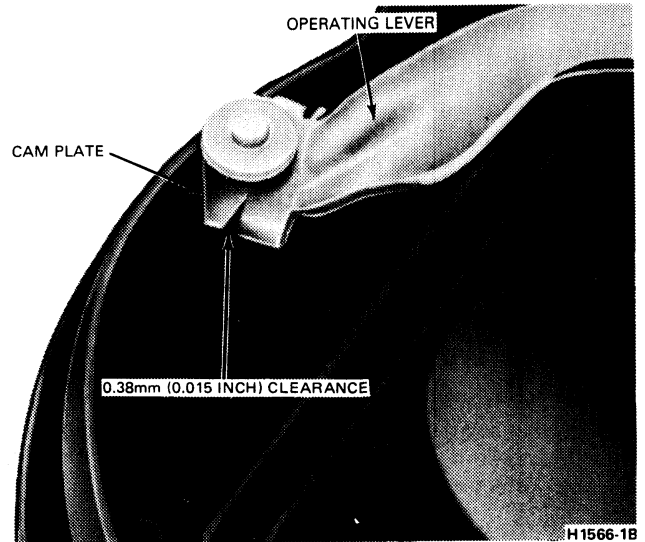
FIG. 3 – PARKING BRAKE INITIAL ADJUSTMENT
F-100-F-350, E-100-E-350 AND BRONCO

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**FIG. 3 Parking Brake Initial Adjustment F-100—
F-350, E-100—E-350 and Bronco**

EXTERNAL BAND TYPE

1. On cable controlled parking brakes (Fig. 5), move the parking brake lever to the fully released position. On a vehicle with a rod-type linkage, set the lever at the first notch.



**FIG. 4 Parking Brake Operating Lever and Cam
Plate Clearance Web Ledge Brakes**

2. Check the position of the cam to make sure the flat portion is resting on the brake band bracket. If the cam is not flat with the bracket, remove the clevis pin from the upper part of the cam, and adjust the clevis rod until the flat portion of the cam rests on the brake band bracket. Install the clevis pin and cotter pin (Fig. 5).

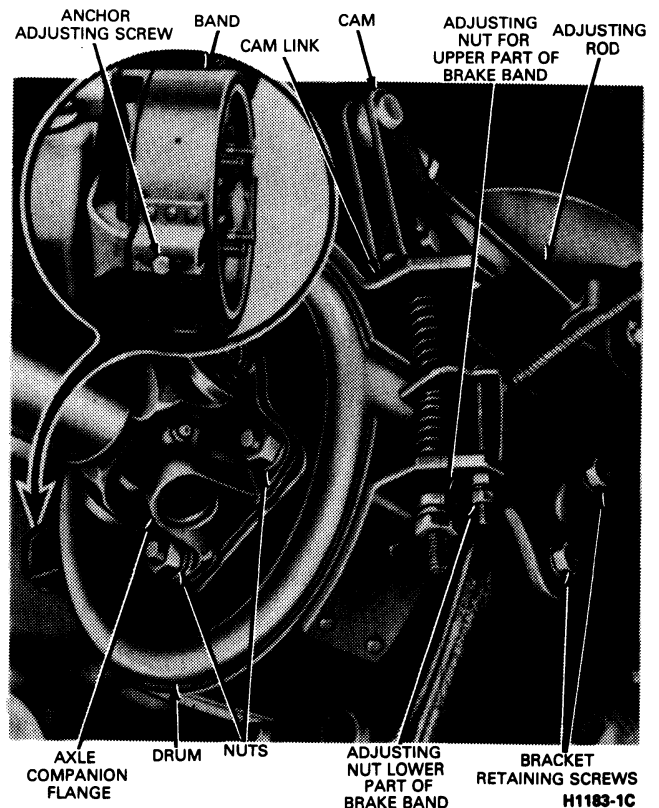


FIG. 5 External Band Type Parking Brake

3. Remove the lock wire from the anchor adjusting screw, and turn the adjusting screw clockwise until a clearance of 0.254 mm (0.010 inch) is established

between the brake lining and the brake drum at the anchor bracket. Install the lock wire in the anchor adjusting screw.

- Loosen the locknut on the adjusting screw for the lower half of the brake band, and adjust the screw to establish a 0.254 mm (0.010 inch) clearance between the lining and the brake drum at the lower half of the brake band (Fig. 5). Tighten the locknut.
- Turn the upper band adjusting rod nut until a 0.254 mm (0.010 inch) clearance is established between the upper half of the band and the drum.

ALL INTERNAL SHOE TYPE (9 INCH DIAMETER)

- Release the parking brake lever in the cab.
- From under the truck, remove the cotter pin from the parking brake linkage adjusting clevis pin (Fig. 6). Remove the clevis pin.

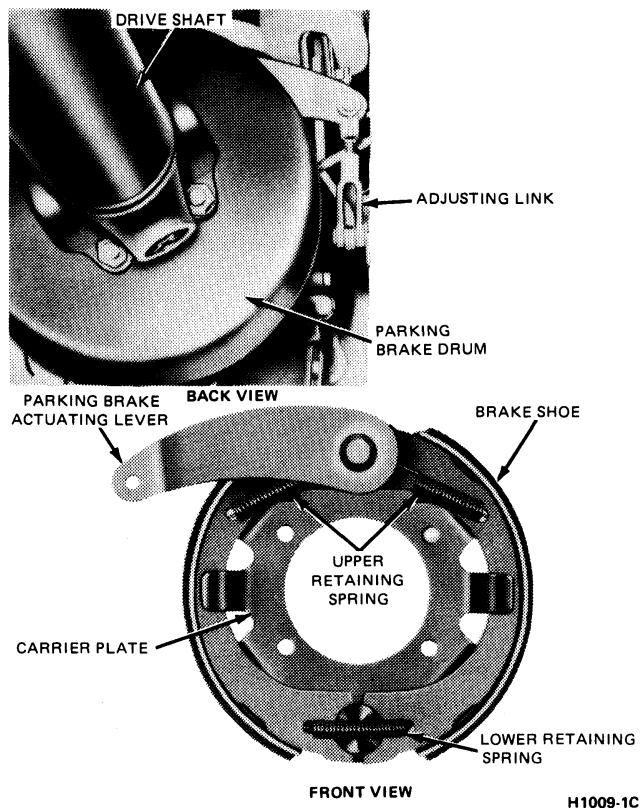


FIG. 6 Transmission Mounted Internal Shoe Type Parking Brake—9-10-12 Inch

- Lengthen the parking brake adjusting link by turning the clevis. Continue to lengthen the adjusting link until the shoes seat against the drum when the clevis pin is installed.
- Remove the clevis pin and shorten the linkage adjustment until there is 0.254 mm (0.010 inch) clearance between the shoes and the drum. The measurement should be taken at all points around the drum with the clevis pin installed.
- Install a new cotter pin in the clevis retaining pin and check the brake operation.

TEN AND TWELVE INCH DIAMETER DRUM BRAKE ADJUSTMENT

There is no internal adjustment on this brake. Adjustment is made on the linkage.

- Remove the clevis pin, loosen the nuts on the adjusting rod and turn the clevis on the nut until a 6.35-9.52 mm (1/4 to 3/8 inch) free play is obtained at the brake lever.
- Tighten the nuts, and connect the clevis to the bellcrank with the clevis pin.

SPRING BRAKE MANUAL RELEASE

MGM STOPGARD

MANUAL RELEASE

- Block the wheels to prevent the vehicle from moving.
- Remove the snap on breather cap.
- Using a 15/16 inch wrench, unscrew the release bolt (Fig. 7) approximately 30 turns until the brake shoes release from the drum. If the release bolt binds, apply rust penetrant (ESR-M99C56-A) or equivalent and allow it to soak into the threads.

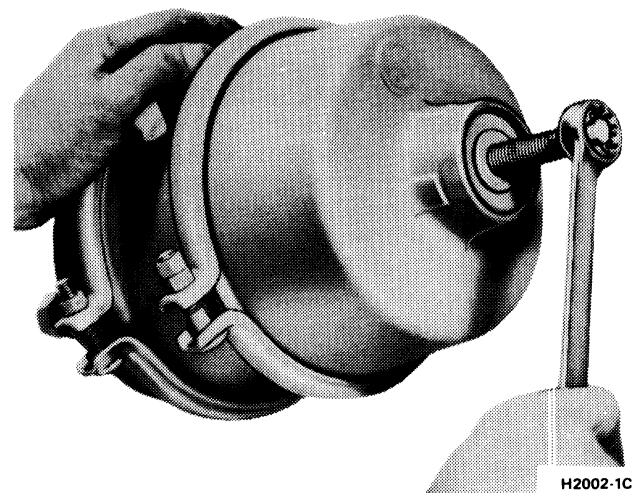


FIG. 7 MGM Stopgard Parking (Spring) Brake Manual Release

MANUAL RESET

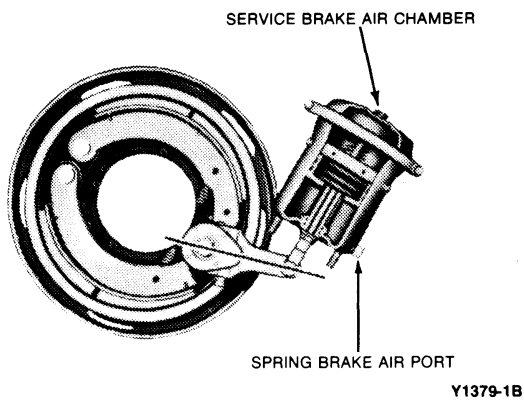
If the release bolt threads are dry, coat the bolt with chassis lubricant. Screw the release bolt down into the unit until the nut bottoms against the case. Tighten the nut to 67 N·m (50 ft-lbs).

MAXIBRAKE MANUAL RELEASE

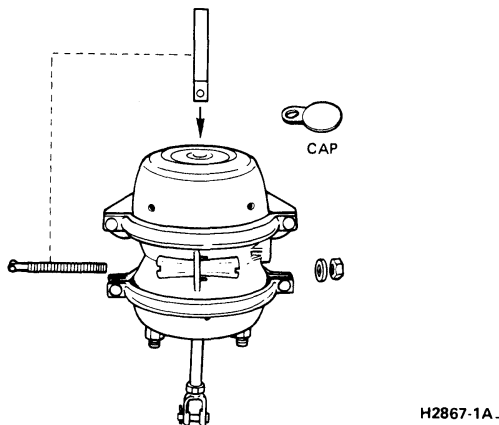
- Disconnect air hoses from spring brake port of the chamber (Fig. 8).
- Install Schrader valves in chambers.
- Charge chambers with air from outside source.
- Remove Schrader valves and re-connect all lines.

ANCHORLOK SERVICE AND PARKING BRAKE

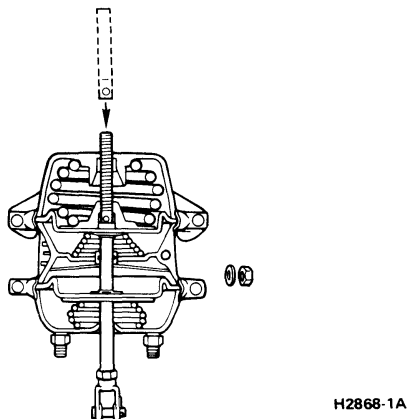
- Remove the cap from spring chamber. Remove

**FIG. 8 Maxibrake Manual Release**

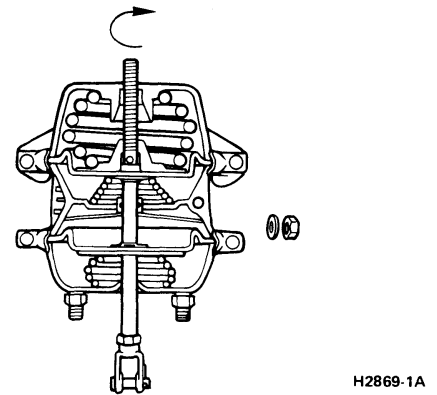
release stud assembly from side pocket by removing the release nut and washer from the release stud and sliding out the release stud. (Fig. 9).

**FIG. 9 Removing Release Stud**

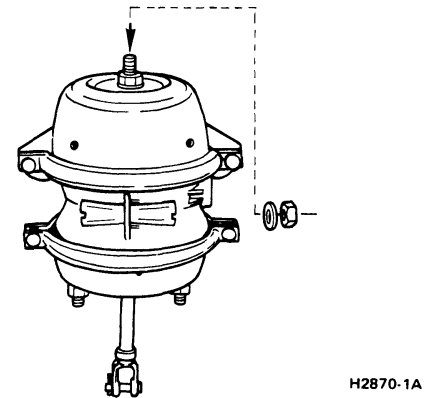
2. Insert release stud through opening (where cap was removed) in the spring chamber and insert into pressure plate (Fig. 10).

**FIG. 10 Installing Release Stud**

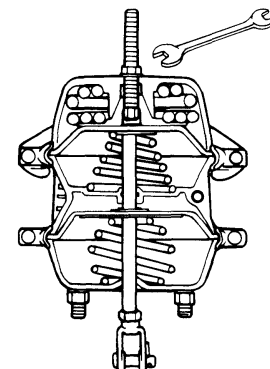
3. Turn release stud 1/4 turn (clockwise) in pressure plate to secure cross pin into cross pin area of pressure plate and lock into manual release position. (Fig. 11).

**FIG. 11 Locking Chamber Into Manual Release Position**

4. Assemble release stud washer and nut onto release stud (Fig. 12).

**FIG. 12 Installing Stud Washer and Nut**

5. Turn release stud assembly nut with wrench until compression spring is fully caged. (Fig. 13). While doing so, check visually to make certain the push rod (adapter push rod or service push rod) is retracting while tightening the release stud assembly nut. Do not over-tighten release stud assembly. THE SPRING BRAKE NOW HAS BEEN MECHANICALLY RELEASED.

**FIG. 13 Turning Release Stud**

Do not loosen or remove the release stud and nut unless the brake chamber is completely assembled and is securely clamped.

BRAKE PEDAL ADJUSTMENT—HYDRAULIC BRAKES

On dual-brake master cylinder equipped vehicles, the brake systems are designed to permit full stroke of the master cylinder when the brake pedal is fully depressed. A brake pedal clearance adjustment is not required.

To release the brakes, fluid in a hydraulic brake system must flow back to the master cylinder when pedal pressure is released. A port is provided in the

master cylinder to allow this flow, but the piston must move back far enough to expose the return port. Free-travel is built into the pedal linkage on single master cylinders with non-power brakes or frame-mounted booster systems to insure this. This free-travel prevents the piston from becoming trapped in a partially released position. Pedal free-travel is not always perceptible in cowl mounted booster systems, however, because the operating clearance for the piston is adjusted at the booster push rod, rather than the pedal linkage (refer to Group 12 of the Truck Shop Manual for instructions on cowl mounted booster push rod adjustments).

Pedal free travel is not adjustable on 500-9000 Series trucks with a cowl mounted booster and a single or dual system or units with a dual system and a frame-mounted booster.

SPECIFICATIONS

Refer to Volume 1 of the Truck Shop Manual for any specifications or Special Tools not contained in this Section.

PARKING BRAKE CABLE TENSION ADJUSTMENT

Model	Cable Tension ①	N•m
F-100-F-350	80 lbs	108
Bronco	80 lbs	108
E-100-E-350 ②	60 lbs	81

① With parking brake control in the second tooth

② E-250, E-350 with Dana rear axle, 65 lbs (88 N•m)

CH2506-1D

SPECIAL TOOLS

Number	Description
110002	Brake Shoe Adjustment Gauge
210018	Cable Tension Gauge

CH2711-1B

SPECIFIC TORQUE LIMITS

Description	Size	Torque Limits	
		(ft-lbs)	N•m
Front Backing Plate to Spindle	1/2 x 13	55-70	75-94
	7/16 x 14	30-50	41-67
	1/2 x 20	55-75	75-101
	1-3/8 x 24	30-40	41-54
Front Backing Plate and Steering Arm to Spindle	1/2 x 13	30-40	41-54
	1/2 x 20	50-70	68-94
Rear Backing Plate to Axle	1/2 x 13	75-105	102-142
	1/2 x 20	50-70	68-94
	7/16 x 14	35-45	48-61
Brake Assembly to Front Axle (600-900 Series)	9/16 x 18	135-160	184-216
	1/2 x 13	75-105	102-142
	5/8 x 18	180-240	245-325
	3/4 x 16	240-300	326-406
Brake Drum to Hub Nuts or Bolts (600-900 Series)	1/2 x 13	68-85	93-115
	5/8 x 18	136-170	185-230
Master Cylinder or Booster Push Rod to Brake Pedal (600-900 Series)	3/8 x 16	12-17	17-23
Master Cylinder to Dash Panel (600-900 Series)	5/16 x 18	12-17	17-23
	3/8 x 16	31-42	43-56
Master Cylinder to Booster (Dash Mounted Booster) (600-700 Series)		14-18	19-24
Booster to Dash Panel (Dash Mounted Booster) (600-700 Series)	3/8 x 16	12-17	17-23
	3/8 x 24	13-20	18-27
	5/16 x 18	12-15	17-20
Master Cylinder to Pedal Bracket	5/16 x 24	12-15	17-20
	3/8 x 24	12-17	17-23
Front Caliper Support to Spindle F-250-350 (4x2)	1/2 x 13	75-125	102-169
Front Caliper Support to Spindle (All 4x4 Vehicles)	1/2 x 13	50-60	68-81
Hydraulic Tube Nuts	3/8 x 24	10-15 ○	14-20 ○
	7/16 x 24	10-15 ○	14-20 ○
	1/2 x 20	10-17 ○	14-23 ○
	9/16 x 18	10-17 ○	14-23 ○
Nylon Tube Nuts	17/32 x 24	12-17	17-23
	11/16 x 20	20-29	28-39
	1 x 18	31-42	43-56
Air Compressor Pulley Nut	3/4	31-42 ○	43-56 ○
○ All hydraulic line connections (nuts) must be torqued to the specified value and free of leakage.			
○ Advance nut to next cotter pin slot, if necessary, to install cotter pin.			
		(in-lbs)	N•m
Nylon Tube Nut	7/16-24	85-115	9.7-12.9
Eccentric Adjuster Bolt Torque		80-120	9.1-13.5
BRAKE DRUM REPAIR LIMITS (BRAKE LATHE)			
Brake drums are marked with the maximum allowable braking surface diameter. If this diameter is exceeded by wear or refinishing, the drum must be replaced.			

S-CAM BRAKE ADJUSTMENT TABLE

Brake Chamber Type No.	Maximum Stroke at Which Brake Should Be Adjusted ○		Maximum Stroke After Adjustment ○	
	MM	Inch	MM	Inch
9	38.10	1½	28.57 ± 3.17mm at 689 kPa	1½ ± ⅛ inch at 100 psi
12	38.10	1½	28.57 ± 3.17mm at 689 kPa	1½ ± ⅛ inch at 100 psi
16	38.10	1½	38.10 ± 3.17mm at 689 kPa	1½ ± ⅛ inch at 100 psi
20	44.45	1¾	33.10 ± 3.17mm at 689 kPa	1½ ± ⅛ inch at 100 psi
24	44.45	1¾	38.10 ± 3.17mm at 689 kPa	1½ ± ⅛ inch at 100 psi
30	50.80	2	41.27 ± 3.17mm at 689 kPa	1½ ± ⅛ inch at 100 psi
36	57.15	2¼	41.27 ± 3.17mm at 689 kPa	1½ ± ⅛ inch at 100 psi
○ Push rod stroke is measured from chamber or chamber mounting bracket to push rod clevis.				

AIR SUPPLY SYSTEM — AIR BRAKE SYSTEM PRESSURE SETTING

Description	kPa	PSI
Safety Valve Setting (Air Pressure)	986-1082	143-157
Warning Buzzer Operating Pressure	413 or Less	60 or Less
Cut-Out Pressure (Governor)	793-861	115-125
Cut-In Pressure (Governor)	655-689	95-100

AIR BRAKE LINE TYPES

SAE J844 Type 3A — For ¼ Inch
SAE J844 Type 3B — For ⅜, ½, ¾ Inch

Steering

PART 50-13

SUBJECT	PAGE	SUBJECT	PAGE
LUBRICATION		MAINTENANCE (Cont'd.)	
Lubricate Steering Column		Ross HF-54 and HF-64	
U-Joints'	50-13-2	Integral Steering Gear	50-13-5
Lubricate Steering Linkage	50-13-2	Ross HF-54 and HF-64	
Power Steering Reservoir		Integral Steering Gear	
Fluid Level	50-13-1	Underloader Valve Adjustment	50-13-5
Steering Gear Lubricant Level —		Ross HFB-52 Integral	
Manual Steering		Steering Gear	50-13-5
E-100 — E-350 and		Saginaw Integral Power	
F-100 — F-350	50-13-2	Steering Gear Adjustment	50-13-4
All Mounts thru 9000 Series		Steering Worm and Sector	
and P-600	50-13-2	Gear Adjustment — E-100 — E-350	
MAINTENANCE		(Manual Gear)	50-13-2
Power Steering Filter		Worm and Roller Mesh	
Replacement — Eaton	50-13-6	Adjustment	50-13-3
Power Steering Pump Belt		Worm Bearing Preload	50-13-5
Tension Adjustment	50-13-6	F, B, L, C-600-9000	50-13-3
Replace Power Steering Pump Reservoir		Steering Stop Adjustments	50-13-2
Fluid Filter — Except F-100 — F-350		Manual Integral or Semi-Integral	
Bronco and E-100 — E-350	50-13-6	Steering Gear	50-13-2
Saginaw Pump Level Check	50-13-6	Torque Checks	50-13-6
Steering Gear Adjustments		PRE-DELIVERY	50-13-1
Ford Integral Power Steering		SPECIFICATIONS	50-13-6
Gear Adjustment F-100 — F-350			
F-150 — F-250 (4 x 4) Bronco . . .	50-13-4		

PRE-DELIVERY

Refer to Part 50-02.

LUBRICATION

POWER STEERING RESERVOIR FLUID LEVEL

Run engine until fluid is at normal operating temperature. Then, turn steering wheel all the way to the left and right several times. Make sure that wheels are in the straight-ahead position, then shut off the engine.

Check the fluid level in the power steering reservoir. The level must show between the full hot and full cold

mark on the dipstick, depending on temperature. If the level is low, add fluid. Refer to the Lubricants Chart in Part 50-03 for the fluid specification number. **Do not over-fill the reservoir.** Remove excess fluid with a suction device. Check system for leaks.

LUBRICATE STEERING LINKAGE

Apply the specified chassis lubricant (Part 50-03, Lubrication Charts and Lubricant Specifications with a pressure gun at all fittings on the linkage.

LUBRICATE STEERING COLUMN U-JOINTS

Apply Ford Chassis Lubricant or equivalent to the U-joint fittings, using a pressure gun. Refer to Part 50-03, Lubrication Charts and Lubricant Specifications for lubricant specifications.

STEERING GEAR LUBRICANT LEVEL MANUAL STEERING

E-100—E-350 AND F-100—F-350 MANUAL STEERING

This steering gear is factory filled with steering gear lubricant and seasonal change of this lubricant should not be performed and the housing, should not be drained—no lubricant is required for the life of the steering gear.

Every 26,050 km (30,000 miles), the gear should be inspected for seal leakage (actual solid grease—not just oily film). If the seal is replaced or the gear is overhauled, the gear housing should be refilled. Refer to Part 13-33 Manual Steering Gear-Recirculating Ball, for recommended lubricant and fill procedure.

ALL MOUNTS THRU 9000 SERIES WITH MANUAL STEERING

1. Remove the filler plug from the top of the steering gear housing.
2. Check the lubricant level. If the level is to the bottom of the filler plug opening, reinstall the filler plug. If the level is below the bottom of the filler plug hole, add fluid C1AZ-19582-A or equivalent to raise the level to the bottom of the filler plug hole. Do not use a pressure gun as it could damage the seals in the gear.

MAINTENANCE

STEERING STOP ADJUSTMENTS

To avoid tire or steering linkage damage, the steering stop angle should be checked periodically, and adjusted, to specification, if necessary.

Fig. 1 shows the position of the front wheels when checking the stop adjustment angles shown in Group 14 of the Truck Shop Manual.

NOTE: The steering stops are not adjustable on Twin-I-Beam axles and 12,000 lbs front axle C- and L-Series.

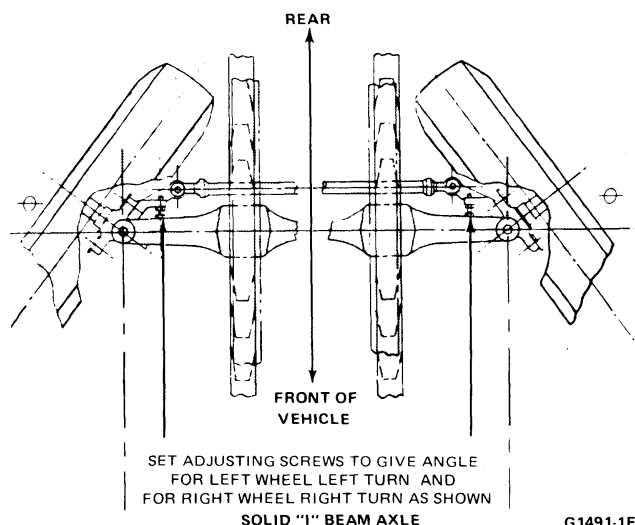


FIG. 1 Spindle Arm Stop Adjustment—All Except Twin-I-Beam Vehicles and 12,000 lbs Front Axle L- and C-Series

MANUAL, INTEGRAL OR SEMI-INTEGRAL POWER STEERING GEAR

The following spindle stop adjustment is the only one required:

1. Raise the front of vehicle until wheels clear floor.
2. Set spindle stop bolts to obtain specified angle.

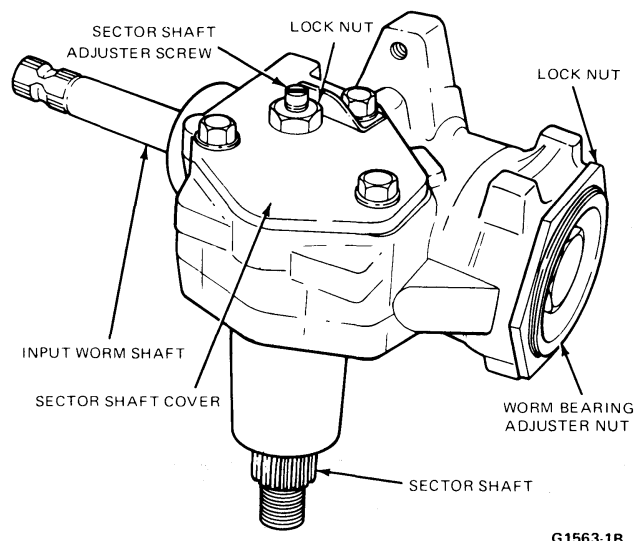
STEERING GEAR ADJUSTMENTS

STEERING WORM AND SECTOR GEAR ADJUSTMENT—F-100—F-350 AND E-100—E-350 (MANUAL GEAR)

Refer to Fig. 2.

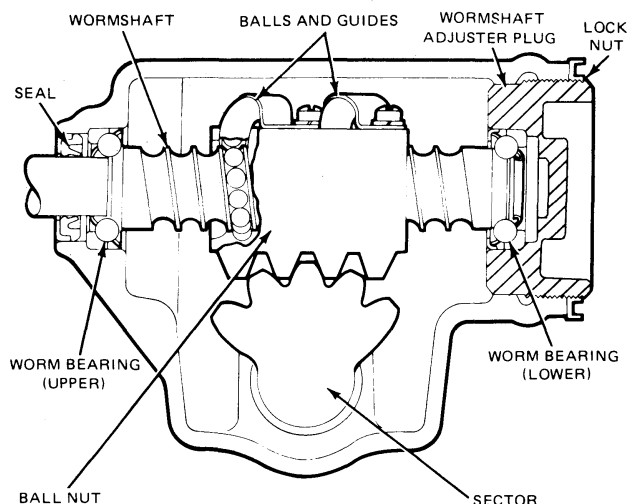
Before adjusting the steering worm and sector:

1. Be sure the steering column is properly aligned, and not causing excessive turning effort.
2. Remove the steering gear from the vehicle.
Make adjustments in the following order to avoid damage or gear malfunction.
3. Tighten the worm bearing adjuster plug until all end play has been removed and then loosen one-quarter turn (Fig. 3). Lubricate wormshaft with a drop at power steering fluid.
4. Using an 11/16" 12-point socket and an in-lb torque wrench, carefully turn the wormshaft all the way to the right and then turn back about one-half turn (Fig. 4).
5. Tighten the adjuster plug until the proper thrust bearing preload is obtained (0.6-1.0 N·m or 5-8 in-lbs). Tighten the adjuster plug locknut to Specifications.
6. Rotate the wormshaft from stop to stop, counting the total number of turns and then turn back half way, thus placing the gear on center.
7. Turn the preload adjuster screw clockwise to remove all lash between the ball nut and sector teeth. Tighten the locknut (Fig. 4).
8. Again using the 11/16" 12-point socket and an in-lb torque wrench, observe the highest reading while the gear is turned through center position. The reading should not exceed 2 N·m (16 in-lbs).



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FIG. 2 Manual Steering Gear—Recirculating Ball—F-100—F-350 and E-100—E-350



G2232-1C

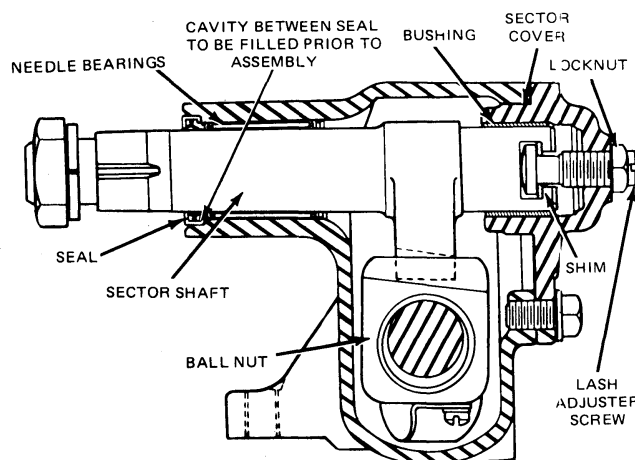
FIG. 3 Manual Steering Gear—Recirculating Ball—E-100—E-350, F-100—F-350

9. If necessary, readjust preload adjuster screw to obtain proper torque. Tighten the locknut to 34 N·m (25 ft-lbs) and again check torque reading through center of travel.

WORM BEARING PRELOAD ADJUSTMENT

F-B-L-C-600-9000

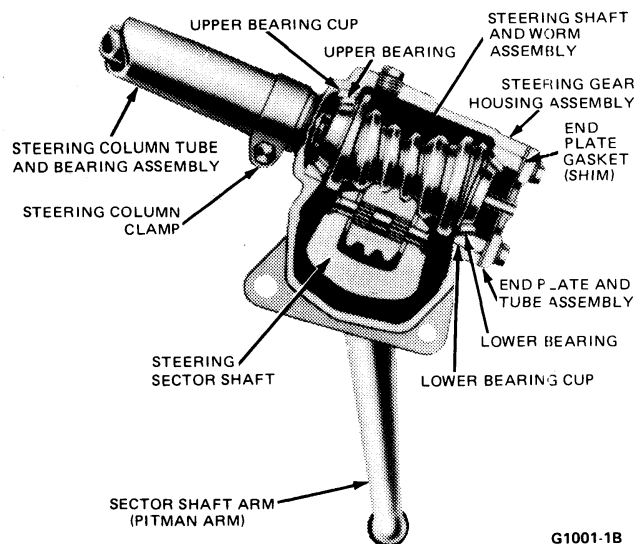
1. Remove the steering gear from the vehicle. Refer to Part 13-34 Manual Steering Gear—Worm and Roller.
2. Place a 12 point socket on the lower steering shaft serrations. Attach an in-lb torque wrench to the socket and measure the lowest torque required to turn the steering gear at a constant speed. This measurement is the worm bearing preload.
3. To adjust worm bearing preload, remove or add shims between the worm shaft bearing retainer and the cover (Fig. 5) to bring preload within specifications. Install the cover and tighten to



G2233-1B

FIG. 4 Sector Shaft—To Wormshaft Mesh

specification (see Specifications at the end of this Part).



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FIG. 5 Typical Gemmer Steering Gear

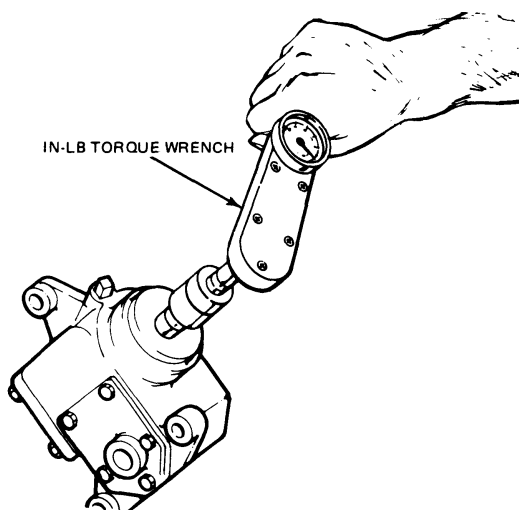
4. Adjust the worm and roller mesh preload (see below).
5. Install the steering gear in the vehicle.

WORM AND ROLLER MESH ADJUSTMENT

The worm bearing preload should always be adjusted, if necessary, before the worm and roller mesh is checked and adjusted.

1. Remove the steering gear from the vehicle.
2. Place an in-lb torque wrench on the steering gear input shaft and measure the torque required to turn the steering wheel through the straight-ahead (high point) position. The highest torque reading is the worm and roller mesh preload. If the preload is not within specification, adjust as outlined in Steps 3, 4, and 5 (Fig. 6).
3. To adjust the mesh, loosen the adjusting screw

locknut on the side of the steering gear housing (Fig. 8) and turn the screw clockwise to tighten mesh or counterclockwise to loosen the mesh.



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FIG. 6 Checking Steering Gear Preload—F-B-L and C-600-9000

4. When mesh is within specifications hold the adjusting screw in place with a screwdriver and tighten the locknut
5. Re-check the mesh and repeat Steps 3 and 4, if necessary.
6. Install the steering gear and fill it to the correct level with the specified lubricant (Part 50-03, Lubrication Charts and Lubricant Specifications).

SAGINAW INTEGRAL POWER STEERING GEAR ADJUSTMENT

The only adjustment that need be performed is the total over center position load (mesh load) to eliminate excessive lash between the sector shaft and rack teeth.

1. Insure the steering column is properly aligned, (see Part 13-06, Steering Column—Shift Rod Within Tube).
2. **E-100—E-350** —Remove drag link from the Pitman arm using Tool T64P-3590-F and remove horn pad.
3. Disconnect the fluid return line at the reservoir and cap reservoir return.
4. Place end of the return line in a clean container and turn the steering wheel from left to right several times to discharge the fluid from the gear.
5. Using a calibrated in-lb torque wrench on the steering wheel nut, rotate shaft slowly and check the following torques.
 - One-half turn off right and left stops
 - One-half turn off center—right and left
 - Over center (rotate through an arc 180 degrees each side).
6. Correct over-center mesh load torques for new and used gears are as follows:
 - a. New gear over-center torque to be 0.45-0.90 N·m (4-9 in-lbs) greater than end readings.

- b. Used gear (more than 643 km or 400 miles) over center torque to be 0.45-0.56 N·m (4-5 in-lbs) greater than end readings.
7. If over-center mesh load torque is not within specification adjust as follows:
 - a. Make sure the sector shaft over-center adjusting screw is backed all the way out. Then turned back in 1/2 turn.
 - b. Install an in-lb torque wrench on the steering wheel nut.
 - c. Rotate the shaft from one stop to the other. Count the number of turns and locate the center of travel, then check the combined ball and thrust bearing preload by rotating the torque wrench through the center of travel. Note the highest reading.
 - d. Tighten the sector shaft over-center adjusting screw until the torque wrench reads 0.56 N·m (5 in-lbs) higher than the reading noted in Step C.
 - e. While holding the adjusting screw, tighten the locknut to 47 N·m (35 ft-lbs) and re-check the adjustment.
8. **E-100—E350** —Replace drag link and horn pad.
9. Connect the fluid return line to the P/S pump reservoir and fill the system to specification. Use Ford Automatic Transmission Fluid Type F, Part No. C1AZ-19582-A, C, D or equivalent.

FORD INTEGRAL POWER STEERING GEAR ADJUSTMENT—F-100-F-350, F-150—F-250 (4x4) AND BRONCO

The only adjustment which can be performed is the total over center position load, to eliminate excessive lash between the sector and rack teeth.

1. Disconnect the Pitman arm from the sector shaft using Tool T64P-3590-F.
2. Disconnect the fluid return line at the reservoir, at the same time cap the reservoir return line pipe.
3. Place the end of the return line in a clean container and cycle the steering wheel in both directions as required, to discharge the fluid from the gear.
4. Turn the steering wheel to 45 degrees from the left stop.
5. Using an in-lb torque wrench on the steering wheel nut, determine the torque required to rotate the shaft slowly through an approximately 1/8 turn from the 45 degree position.
6. Turn the steering gear back to center, then determine the torque required to rotate the shaft back and forth across the center position. Loosen the adjuster nut, and turn the adjuster screw (Fig. 7) until the reading is 1.6-2.0 N·m (14-18 in.-lbs) greater than the torque 45 degrees from the stop. Hold the screw in place and tighten the lock nut.
7. Re-check the readings and replace the Pitman arm and the steering wheel hub cover.
8. Connect the fluid return line to the reservoir and fill the reservoir with specified lubricant to the proper level.

Do not pry against the reservoir to obtain proper belt load as it can be deformed and cause a leak.

9. Re-check the belt tension.

ROSS HF-54 AND HF-64 INTEGRAL STEERING GEAR

Sector Shaft Adjustment

1. Disconnect the drag link from the Pitman arm.
2. Center the steering wheel. Grasp the Pitman arm and check it for free movement (lash) between the sector shaft and the rack piston.
3. Loosen the sector shaft adjustment screw locknut on the side cover.
4. After rotating the input shaft through its full travel for a minimum of five cycles, adjust the sector shaft adjusting screw to provide 2.25-2.80mm (20-25 in-lbs) torque as the input shaft is rotated 90 degrees each side of center.
5. Loosen the adjusting screw one turn and note the torque required to move the input shaft 90 degrees each side of the center position. Tighten the adjusting screw jam nut until snug, and tighten the adjusting screw to provide an increase of 2 to 4 in-lb at a input shaft within 45 degrees each side of center. Tighten the adjusting screw jam nut to 55-61 N·m (20-25 ft-lbs). The input torque of the completely assembled gear, minus hydraulic oil, should not exceed 1.6 N·m (15 in-lbs) for the full travel of the output shaft.
6. Connect the drag link to the Pitman arm
7. Refill the system with the specified fluid (Part 50-03 Lubrication Charts and Lubricant Specifications).

ROSS HF-54 AND HF-64, INTEGRAL STEERING GEAR UNDERLOADER VALVE ADJUSTMENT

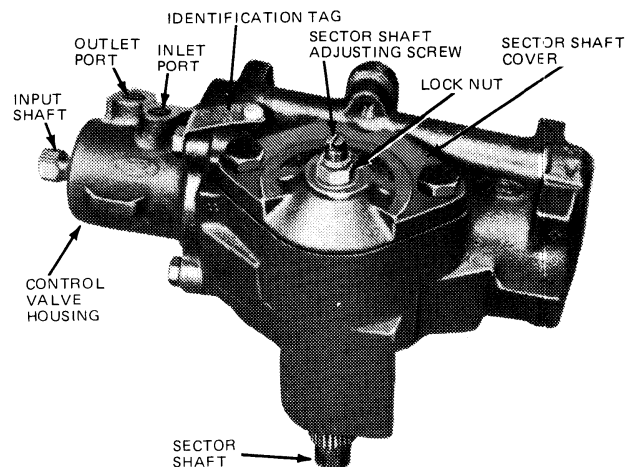
This underloader valve adjustment is for right turn only on HF-54 model gears and for both turns on HF-64 models.

Before adjusting the unloader valve, find the vehicle's straight ahead position by driving with hands off the steering wheel, allowing the unit to find its own center. Mark this center on the steering column and steering wheel with chalk or masking tape.

1. Check the front wheel turning angles and adjust, if necessary, with the wheels off the ground (Part 14-01 General Suspension Service).
2. Return the wheels to the straight ahead position and lower the vehicle.
3. **RIGHT TURN—HF-54 or HF-64 Gears:** With the engine at idle, the vehicle standing still, and the fluid at normal operating temperature, rotate the steering wheel to the right the specified number of turns. (See the table at the end of Part 13-44 Integral Power Steering Gears—Ross HF-54, HF-64).
4. Hold the steering wheel in this position, loosen the locknut and turn the unloader valve pressure adjusting screw until a hiss is audible.

On HF-64 gears, check the clearance between the Pitman arm and the Pitman arm stop for the right turn cast on the gear housing. Clearance must be 1.587-3.175mm (1/16 to 1/8 inch) minimum to prevent the Pitman arm from contacting the stop prior to contacting the unloader valve.

5. Drive the vehicle to return the steering wheel to the



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FIG. 7 Adjusting Mesh Load—Ford Integral Power Steering Gear—F-100—F-350 and Bronco

straight ahead position. Stop the vehicle and rotate the steering wheel to the right the specified number of turns and check for the hiss. Re-adjust, if necessary, as described in Step 4, and repeat Step 5.

6. **LEFT TURN—HF-64 GEARS ONLY:** Rotate the steering wheel to the left the specified number of turns (see the table at the end of Part 13-44), and repeat Steps 3, 4, and 5.

ROSS HFB-52 INTEGRAL STEERING GEAR

SECTOR SHAFT ADJUSTMENT

1. Loosen locknut on side cover adjusting screw. Adjust screw to provide a 2.6-3.1 N·m (23-28 in-lbs) torque at worm shaft as steering gear is moved 90 degrees each side of center.
2. Back out adjusting screw one turn and note torque required to move through 90 degrees each side of center.
3. Move adjusting screw in to provide a rise in torque of 0.23-0.45 N·m (2 - 4 in-lbs) at a point within 45 degrees each side of center. Tighten locknut to 5.5-6.1 N·m (40-45 ft-lbs).
4. After tightening locknut, the torque to rotate the worm shaft must not exceed 2.9 N·m (26 in-lbs) at any point of steering gear travel.

WORM BEARING PRELOAD

1. Loosen jam nut on adjusting screw.
2. Tighten the adjusting screw to 2.8-3.3 N·m (25-30 in-lbs). Tighten the jam nut to 5.5-6.7 N·m (40-50 ft-lbs) while holding the adjusting screw so that it does not rotate when the jam nut is tightened.

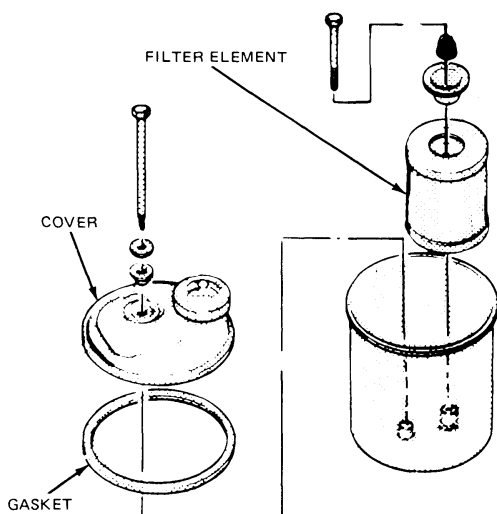
The purpose of this adjustment is to put a light preload on the worm thrust bearing package items. After the adjustment has been made, there should be no perceptible movement (in and out) of the input shaft when it is moved from right turn to left turn and back. The input shaft should rotate smoothly and without binding through full travel of steering gear with a maximum torque of 2.9 N·m (26 in-lbs).

POWER STEERING PUMP BELT TENSION ADJUSTMENT

Refer to Part 50-21, Gasoline Engines, of this Manual for procedure.

REPLACE POWER STEERING PUMP RESERVOIR FLUID FILTER—EXCEPT F-100-350 BRONCO AND E-100—E-350

Remove nut and two washers securing reservoir cover and seal. Remove cotter pin, washer, spring, and retainer plate. Lift out filter element and replace with a new one. Re-assemble parts securing filter element, seal and reservoir cover in reverse order of disassembly (Fig. 8). Be sure cover gasket is properly seated. Secure cover with wing nut and two washers.



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FIG. 8 Power Steering Pump Filter

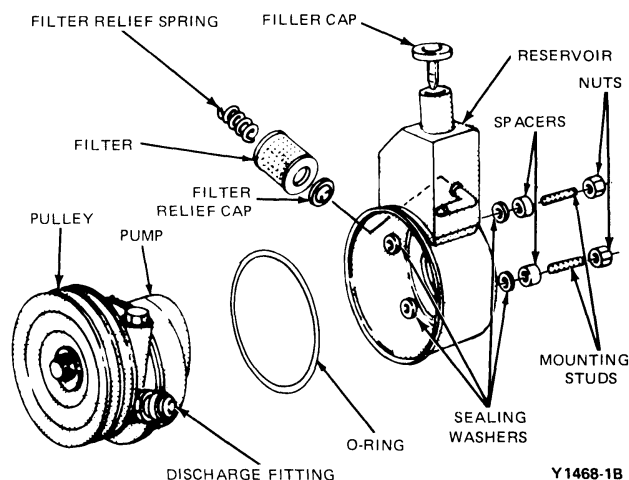
TORQUE CHECKS

Tighten all attaching bolts and nuts at the intervals outlined in the Maintenance Schedules (Part 50-02) to the torque specified in the Specifications Section of this Part or the 1980 Truck Body, Chassis and Electrical Shop Manual.

POWER STEERING FILTER REPLACEMENT—EATON

Disconnect pressure line from steering pump and drain oil into a pan (1 gal. minimum). Disconnect the return line from the reservoir. On some installations, it may be necessary to remove the pump from the vehicle. Remove the reservoir mounting studs and nuts (Fig 9). Tap the reservoir with palm of hand and slightly rotate reservoir around pump base. Carefully rock the reservoir

back and forth and remove it from the pump. **Do not pry the reservoir off the pump.** Remove the filter, filter relief spring and filter cap from inside the reservoir.



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FIG. 9 Power Steering Filter Replacement—Eaton Heavy Duty

Install a new filter clean O-ring groove in pump housing. Apply lubriplate or equivalent lubricant to new O-ring and install into groove with dual ridge (color green) outward. Check to be sure O-ring is not twisted in groove. Inspect reservoir O-ring seal area for any damage, scratches, or out-of-round conditions. Position new sealing washers and studs, then install reservoir over pump so it is fully seated forward. Do not use nuts to draw reservoir onto pump. Install external washers spacers and nuts. Torque nuts and reconnect hoses.

Check the fluid level after the steering system has been serviced. With the engine off, add power steering fluid until the filter is covered. Start the engine, run at fast idle and re-check the fluid level. Add fluid as necessary. Bleed the system by turning the front wheels from side to side (without hitting the wheel stops). Return the wheels to the center position and run the engine for two or three minutes. Turn the engine off and recheck the fluid level. The fluid level should be at the **HOT** mark on the dip stick after the system has stabilized at its normal operating temperature.

SAGINAW PUMP LEVEL CHECK

Check the fluid level in the power steering reservoir on Saginaw pumps. The level must show between the HOT mark and the end of the dipstick. If the fluid level is low, add power steering fluid ESW-M2C33-F or equivalent to the proper level on the dipstick. Do not over-fill the reservoir. Remove excess fluid with a suction device. Check system for leaks.

SPECIFICATIONS

Refer to the appropriate section of Group 13 of the Truck Body, Chassis and Electrical Shop Manual for any

specifications or Special Tools not contained in this Section.

Suspension		PART 50-14	
APPLIES TO ALL MODELS			
SUBJECT	PAGE	SUBJECT	PAGE
LUBRICATION		MAINTENANCE (Cont'd.)	
Front and Rear Spring Leaves and Shackle Pins	50-14-1	Tighten U-Bolts	50-14-1
Front Axle Spindle Pins (Bolts)	50-14-1	Rear Leaf Spring Squeaks F-Series, E-100 — E-350 and Bronco	50-14-1
MAINTENANCE		PRE-DELIVERY	
Check Torques	50-14-1	SPECIFICATIONS	
Inspect Springs and			

PRE-DELIVERY

Refer to Part 50-02.

LUBRICATION

FRONT AND REAR SPRING LEAVES AND SHACKLE PINS

Apply the specified Chassis Lube (Part 50-03) Lubrication Charts and Lubricant Specification to the shackle pin fittings with a pressure gun. Apply SAE 10W engine oil to the spring leaves with a squirt can on medium and Heavy Trucks only. Apply specified

lubricant between Light Truck leaves as required to eliminate squeaks.

FRONT AXLE SPINDLE PINS (BOLTS)

Apply the specified Chassis Lube (Part 50-03) Lubrication Charts and Lubrication Specifications with a pressure gun at the fittings on both spindles.

MAINTENANCE

INSPECT SPRINGS AND TIGHTEN U-BOLTS

Check for broken or sagging spring leaves. Tighten the spring U-bolts to specification, if required.

CHECK TORQUES

Tighten all attaching bolts and nuts at the intervals outlined in the Pre-Delivery Maintenance Schedules (Part 50-02) to the torque specified in the Specifications Section of the 1980 Truck Shop Manual.

REAR LEAF SPRING SQUEAKS

(F-SERIES, E-100—E-350 AND BRONCO)

The most likely causes of rear leaf spring squeaks are loose attachments at the front or rear spring eyes, a scrubbing action between individual leaf springs or

contact between the clinch type clips and the top leaf of the spring assembly.

To correct proceed as follows:

1. Tighten the rear spring front and rear shackle attaching bolts to the proper torque values as given in Fig. 1.
2. With the vehicle raised so the rear axle hangs free so each leaf spring spreads open, apply Lubricant C7AZ-19590-a or equivalent. Lubricant should cover an area approximately 3", making sure the area is thoroughly dry from the tipends at both ends of the spring. It may be necessary to remove and re-install the spring clips to spread the leaf ends far enough to apply the required amount of lubricant.
3. Spread the spring clips to reduce contact pressure between leafs or main leaf clip when lubricant does not eliminate squeak.

Model	Part	Bolt Size	Torque	N•m
F-100-150	Front eye	14mm	75-115 ft-lbs	100-155
F-100-150	Rear eye and shackle to bracket	14mm	75-115 ft-lbs	100-155
F-250-350	Front eye	16mm	150-210 ft-lbs	200-280
F-250-350	Rear eye and shackle to bracket	14mm	75-115 ft-lbs	100-155
E-100-350	Front eye	5/8	150-204 ft-lbs	204-276
E-100-350	Rear eye and shackle to bracket	9/16	75-105 ft-lbs	102-142
Bronco	Front and rear eye	16mm	150-210 ft-lbs	200-280
Bronco	Shackle to bracket and rear eye	14mm	75-115 ft-lbs	100-155

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FIG. 1 Rear Leaf Spring Torque Values

SPECIFICATIONS

Refer to the Light Truck or Medium/Heavy Truck Shop Manual for Suspension Specifications.

Driving Axles and Driveshaft

**PART
50-15**

APPLIES TO ALL MODELS

SUBJECT	PAGE	SUBJECT	PAGE
LUBRICATION		LUBRICATION (Cont'd.)	
Axle Lubricant Level	50-15-1	Two-Speed Axle Air	
All Axles Except Ford		Shift Motor Oil Level	50-15-2
and Tandem	50-15-1	MAINTENANCE	
Tandem Drive Axles	50-15-1	Clean Power Divider Lockout	
Draining and Filling Axle Lubricant		Control Vent Filter	50-15-4
Draining	50-15-1	Clean Two-Speed Tandem	
Filling	50-15-1	Axle Air Shift Motor Vent	50-15-4
Front Wheel Bearings — Repack		Front Wheel Bearing Adjustment —	
4-Wheel Drive Vehicles	50-15-2	4-Wheel Drive, Bronco and	
Repack and Adjust Rear Wheel		F-150 — F-350 (4x4)	50-15-4
Bearings (Dana Full Float		PRE-DELIVERY	50-15-1
Axle Only)	50-15-3	SPECIFICATIONS	50-15-5

PRE-DELIVERY

Refer to Part 50-02.

LUBRICATION

AXLE LUBRICANT LEVEL

The magnetic drain plugs, where used, should be cleaned or replaced each time the lubricant is changed.

Clean dirt and grease from the area around the filler plug, and remove plugs at locations shown on Lubrication Charts (Part 50-03).

Axle must be in normal curb position when checking lubricant levels. If using frame contact hoist, use safety stands to hold axle in position.

Add only specified lubricants.

TANDEM DRIVE AXLES

The axle must be run first, then allowed to stand 5 minutes, to allow lubricant to settle to the proper levels in the power divider case and axle housing. After the 5 minutes, check the lubricant level in the rear filler hole of the forward tandem axle only. It is not necessary to check the oil level in the power divider. If the level is up to the bottom of the filler hole of the forward rear axle, the power divider is also adequately lubricated. If the level is not up to the bottom of the filler hole, add the necessary lubricant. Check the rear tandem axle lubricant level through the rear filler hole.

ALL AXLES EXCEPT FORD AND TANDEM

Remove the filler hole plug. The lubricant should be level with the bottom of the hole.

DRAINING AND FILLING AXLE LUBRICANT

Use only the specified gear lubricants (Part 50-03, Lubrication Charts and Lubricant Specifications).

DRAINING—DANA ONLY

Dana axles do not have a drain plug. The cover should be removed from the housing to allow drainage and the gasket replaced each time the cover is removed. For other axles, use the following procedure:

If possible, drain the lubricant when it is warm and it will run freely, allowing full drainage in minimum time. This is especially desirable in cold weather.

To drain, unscrew the plug at the bottom of the housing and allow sufficient time for all the old oil to run out. On tandem drive axles, also unscrew the plug at the bottom of the power divider for drainage of lubricant in the power divider.

FILLING

Single-Reduction Axles—Ford Axle

The filler hole is in the carrier casting. Fill to the bottom of the hole.

To check these axles for proper lubricant level, the filler plug should be backed out slowly. If seepage occurs around the threads of the plug,

immediately turn the plug back in to avoid any drainage. This condition indicates that the specified amount of lubricant is in the axle.

Others

Fill the axle through the rear filler hole until oil flows from the bottom of the hole. After filling the axle with the specified amount of lubricant, install the oil filler hole plug.

2-Speed Planetary Double Reduction Axles

Fill the axle through the rear filler hole with the specified amount of lubricant until the lubricant is level with the bottom of the filler hole. Then install the filler hole plug. If the carrier assembly oil channels are dry, add one pint of lubricant through the front filler hole.

Tandem Drive Axles

Fill both axles until the lubricant is level with the bottom of the rear filler hole. Then add specified amount of lubricant to the inter-axle differential power divider through the filler hole located in the case.

Eaton D Series Tandem Drive Axles

Fill the forward drive axle until the lubricant is level with the bottom of the filler hole in the rear cover. Then, add two pints through the forward filler hole located slightly to the right in the top portion of the differential carrier. **Do not use the rear hole at top of the differential carrier as a lubricant filler hole.**

Fill the rear axle in accordance with instructions for the type of axle used: single reduction, 2-speed or planetary double reduction.

Rockwell Tandem Axle-Top Mounted

Fill axle housing to bottom of level hole with specified lubrication with vehicle lever. Put an additional 0.94 liter (2 U.S. pints) of specified lubricant in the inter-axle differential housing.

2-SPEED AXLE AIR SHIFT MOTOR OIL LEVEL

The level should be maintained at the bottom of the filler plug hole. Above -17°C (0°F), use SAE 10W engine oil. Below -17°C (0°F), use three parts of SAE 10W engine oil to one part of kerosene. The oil and kerosene mixture can be used safely up to 0°C (32°F), if necessary.

FRONT WHEEL BEARINGS—REPACK

4-WHEEL DRIVE VEHICLES

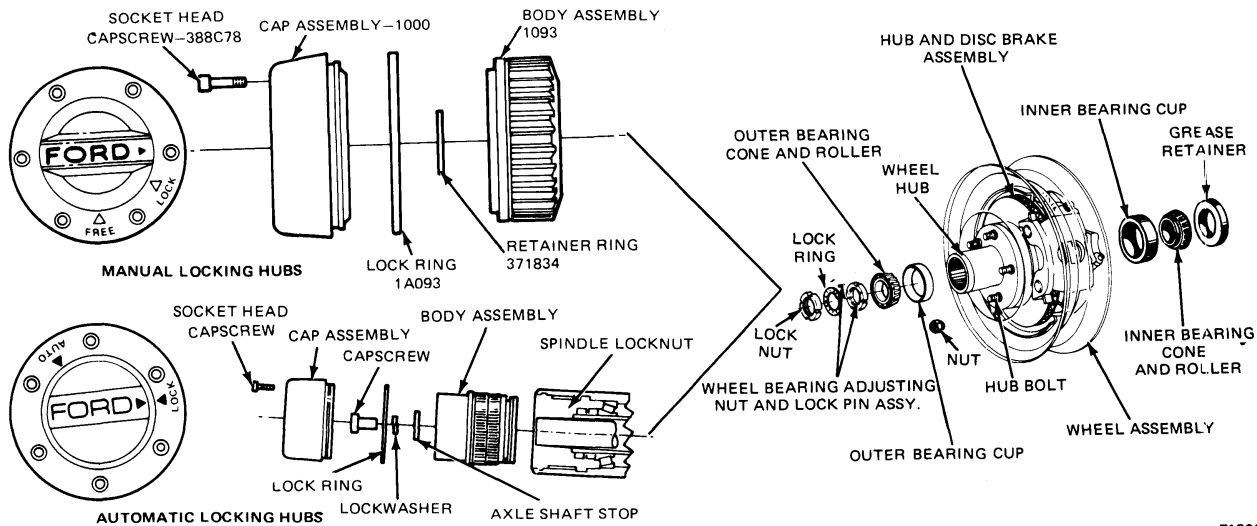
1. Raise the vehicle and install safety stands.
2. Remove the wheel cover, if installed and remove disc brake caliper assembly.
3. Remove the hub assemblies. Refer to Part 11-12 Wheels Hubs and Bearings under Removal and Installation.
4. Remove the front hub grease cap. Remove the driving hub

retaining snap ring (Fig. 1) and slide the splined driving hub from between the axle shaft and the wheel hub. Remove the spring and spring retainer (if equipped with) locking hubs, refer to Part 11-12 Wheel Hubs and Bearings—Front Wheel Drive, 1980 Truck Shop Manual.

5. With Tool T59T-1197-B, remove the locknut, washer, and wheel bearing adjusting nut (Fig. 1) from the spindle. Remove the wheel, hub and rotor as an assembly. The wheel outer bearing will be forced off the spindle at the same time. Protect the spindle and inner bearing cone from dirt.
6. Remove the grease retainer and the inner bearing cone and roller assembly from the hub with Tool T175-AB and T50T-100-A.
7. Clean the lubricant off the inner and outer bearing cups with solvent and inspect the cups for scratches, pits, excessive wear, and other damage. If the cups are worn or damaged, remove them with a drift.
8. Soak a new grease retainer in light engine oil at least 30 minutes before installation. Thoroughly clean the inner and outer bearing cones and rollers with solvent, and dry them thoroughly. **Do not spin the bearings with compressed air.**

Inspect the cone and roller assemblies for wear or damage, and replace them if necessary. **The cone and roller assemblies and the bearing cups should be replaced as a unit if damage to either is found.**

9. Thoroughly clean the spindle and the inside of the hub with solvent to remove all old lubricant.
Cover the spindle with a clean cloth, and brush all loose dust and dirt from the brake assembly. **To prevent getting dirt on the spindle, carefully remove the cloth from the spindle.**
10. If the inner bearing cup was removed, install the cup or a new cup in the hub. **Be sure to seat the cup properly in the hub.**
11. Install the outer bearing cup in the hub with a suitable tool. **Be sure the cup is properly seated in the hub.**
12. Pack the inside of the hub with ESA-MIC75B or an equivalent grease. Add lubricant to the hub until the grease is flush with inside diameter of both bearing cups. Do not over-lubricate.
13. All old grease should be completely cleaned from the bearings before re-packing them with new grease. Pack the bearing cone and roller assemblies with ESA-MIC75B or an equivalent grease. A bearing packer is desirable for this operation such as Rotunda models 120072, 120211 and 120250 or equivalent. If a packer is not available, work as much lubricant as possible between the rollers and cages. Lubricate the cone surfaces with grease.
14. Place the inner bearing cone and roller assembly in the inner cup, and install the new grease retainer. **Be sure that the retainer is properly seated.**
15. Install the wheel, hub, and rotor assembly on the wheel spindle. **Keep the hub centered on the spindle to prevent damage to the grease retainer or the spindle threads.** (If equipped with locking hubs, refer to Part 11-12 Wheel Hubs and



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FIG. 1 Front Wheel and Hub Installation—Front Wheel Drive—Dana 44IFS, 44IFS HD, 50IFS—Bronco, F-150-350 (4x4)

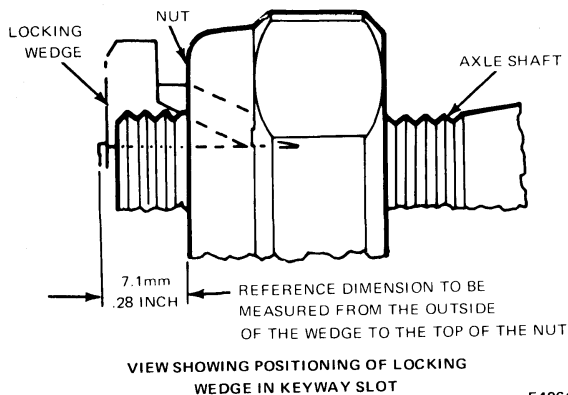
Bearings—Front Wheel Drive of the Truck Shop Manual.)

16. Install the wheel outer bearing cone and adjusting nut. Adjust the front wheel bearings as outlined in this Part.

REPACK AND ADJUST REAR WHEEL BEARINGS (DANA FULL FLOAT AXLE ONLY)

For F-350, E-250-350 and F-350 (4 x 4), the wheel bearings are packed with ESA-M1C75B lubricant C1AZ-19590-B or an equivalent. Axle lubricant can also flow into the wheel hubs and bearings. On these axles, wheel bearing grease is the **primary** lubricant since the grease provides lubrication until the axle lubricant reaches the bearings during normal operation. On these axles, the wheel hub is also vented through the axle housing vent.

1. Set the parking brake and loosen the axle shaft bolts.
2. Raise the rear wheels off the floor and place the work stands under the rear axle housing so that the axle is parallel with the floor.
3. Remove the axle shaft bolts.
4. Remove the axle shaft and gaskets.



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FIG. 2 Removing Locking Wedge From Keyway Slot

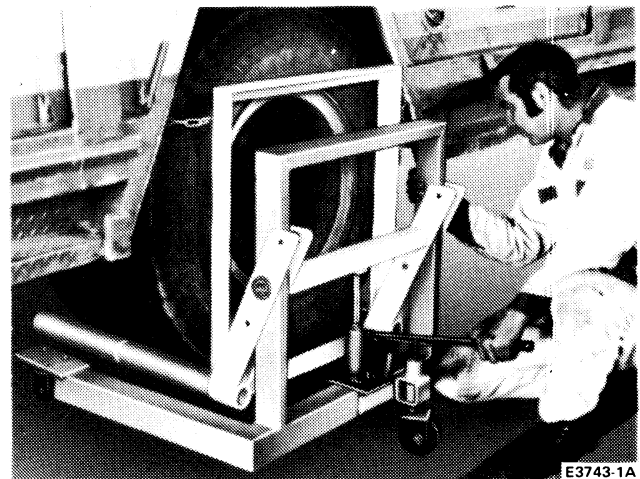


FIG. 3 Heavy Duty Wheel Dolly

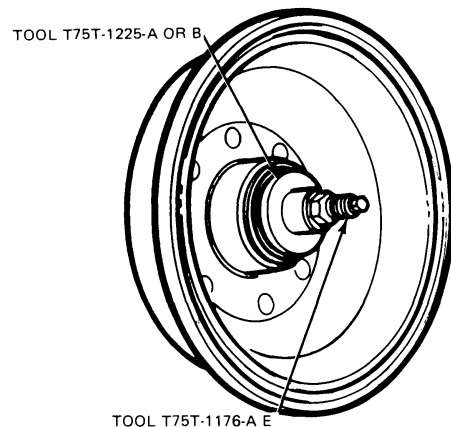


FIG. 4 Installing Rear Axle Bearing

5. Remove the yellow locking wedge from the keyway (insert screwdriver between the flanges of the wedge and outer face of the nut and pry the wedge out) and then remove the lock nut (Fig. 2).
6. With the type of wheel jack shown in Fig. 3 raise

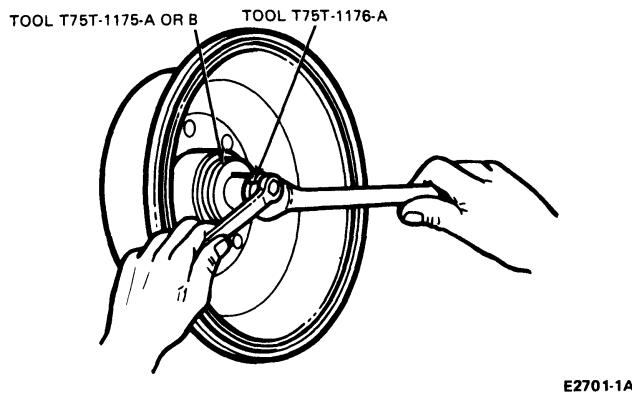


FIG. 5 Installing Rear Axle Seals

the wheel to the point that all wheel weight is removed from the wheel bearings. Remove the outer bearing cone. Now pull the wheel straight off the axle.

7. With a piece of hard wood which will just clear the outer bearing cup, drive the inner bearing cone and inner seal out of the wheel hub.
8. Wash all the old grease or axle lubricant out of the wheel hub, using a suitable solvent.
9. Wash the bearing cups and rollers and inspect for pitting, galling, and uneven wear patterns. Inspect the roller for end wear.
10. If the bearing cups are to be replaced drive them out and replace with Tool T75T-1225-A or B. (Shown in Fig. 4).
11. If bearing cups are properly seated, a 0.0015 inch feeler gauge **will not fit** between the cup and the wheel hub.
12. Pack each bearing cone and roller with a bearing packer tool.
13. Place the inner bearing cone and roller assembly in the wheel hub. Install a new inner seal in the hub using Tool T75T1175-A or B (Fig. 5).
14. Adjust the jack so that the wheel can be installed straight on the axle housing without damaging the inner seal.
15. To obtain proper wheel end play of .001-.010, tighten the lock nut to 120-140 ft-lb while rotating the wheel using Tool OTC 1928 or equivalent.
16. Back-off (loosen) the lock nut $1/8$ - to $3/8$ of a turn so that the nylon above the keyway is solid-uncut from previous wedge installations.
17. With a suitable dial indicator, check wheel assembly end play. If not within specification range of 0.001 to 0.010 inches, the procedure will have to be repeated starting with a loose bearing.

IMPORTANT—The lock nut must be backed off at least $1/8$ turn but not more than $3/8$ turn for .001-.010 end play. If it is not possible to back the nut off within these limits and obtain fresh solid, uncut nylon above the keyway—use a new lock nut.

18. Position the locking wedge in the key way slot. It must not be bottomed against the shoulder of the adjusting nut when fully installed. Install the yellow locking wedge with Tool 75T-1170-A giving the tool a light tap with a hammer.
- IMPORTANT—The yellow locking wedge must be undamaged and in good condition—if in doubt, use a new one.** The locking wedge and the adjusting nut can be used again providing the locking wedge cuts a new groove in the nylon retainer material within $1/8$ to $3/8$ turn specified. The wedge must not be pressed into a previous by cut groove.
19. Install the axle shaft, gasket, lock bolts and washers. Tighten to 40-50 ft-lb torque.
20. Adjust the brakes.

MAINTENANCE

CLEAN POWER DIVIDER LOCKOUT CONTROL VENT FILTER

Remove control cover, piston assembly and vent filter. Clean the parts and soak the piston felt oilers in SAE 10W oil for one hour. Clean and air dry the vent filter. Install the vent filter, piston assembly and cover on the lockout control.

CLEAN 2-SPEED TANDEM AXLE AIR SHIFT MOTOR VENT

Brush off the area surrounding the vent hole to remove dirt or any other foreign matter. If the hole is plugged or partially obstructed, clear it with a piece of wire or other suitable probe.

FRONT WHEEL BEARING ADJUSTMENT—4-WHEEL DRIVE

BRONCO AND F-150—F-350 (4X4)

1. Raise the vehicle and install safety stands.
2. Remove wheel and tire.
3. Remove the driving hubs. Refer to the appropriate section in Part 11-12, Wheel, Hubs, and Bearings—Front Wheel Drive.
4. Remove the wheel bearing locknut and lock ring.
5. Using Tool T59T-1197-B and a torque wrench, tighten the bearing adjusting nut to 67 N·m (50 ft-lbs) while rotating the brake rotor back and forth to seat the bearings.
6. Back off the adjusting nut approximately $1/4$ turn (90 degrees).
7. Assemble the lock ring by turning the nut to the nearest hole where the dowel pin will enter.
8. Install the outer locknut and tighten to 67 N·m (50 ft-lbs).
9. Install the appropriate hub per Part 11-12 Wheel, Hubs and Bearings—Front Wheel Drive.
10. Install wheel and tire.
11. Remove the safety stands and lower the vehicle.

SPECIFICATIONS

Refer to the 1980 Truck Body, Chassis and Electrical Shop Manual for any Specifications or Special Tools not contained in this Section.

AXLE LUBRICANT CAPACITIES

Bronco				
Axle		Approximate Capacity		
		U.S. Pints	Imp. Pints	Litres
Rear Axle — Ford		6½	5¾	3
Front Axle — Dana 44 ISF		4	3¾	1.8
E-100 — E-350				
Axle Model	Truck Model	U.S. Pints	Imp. Pints	Litres
Ford	E-100	6.5 ☉	5¾	3
	E-150			
Dana 61	E-250	6.0 ☉	5	2.8
Dana 70	E-350	6½ ☉	5¾	3
☉ For locking rear axle add 4 oz. friction modifier EST-M2CH8-A or equivalent.				
F-100-350				
Axle Model	Truck Model	U.S. Pints	Imp. Pints	Litres
Ford	F-100-F-150	6.5	5¾	3
Dana 44 ISF (Front Axle)	F-150 4-Wheel Drive	4	3¾	1.8
Dana 44 ISF H.D. (Front Axle)	F-250 4-Wheel Drive	4	3¾	1.8
Dana 50 IFS (Front Axle)	F-350 4-Wheel Drive	5	4.2	2.3
Dana 60	F-250	5 ☉	4.2	2.3
Dana 61.1	F-350	6 ☉	5	2.8
Dana 61-2	F-250	6 ☉	5	2.8
Dana 70	F-350	6½	5¾	3
Dana 70 H.D.	F-350	6 ☉	5	2.8
☉ All locking rear axles add 4 oz. friction modifier EST-M2C118-A or equivalent.				

600, 700-7000 SERIES TRUCKS

Single Speed Axle			
Make and Model	Approximate Capacity (a)		
	U.S. Pints	Imp. Pints	Litres
Eaton 17121	31	25¾	14.6
Rockwell D-140 (d)	13	11	6.1
Rockwell F-106 (b)	16½	14	7.8
Rockwell H-170 (b)	27	22¾	12.7
Two Speed Axle			
Eaton 15201 (b) (d)	17½	14¾	8.2
Eaton 16244 (b) (d)	23	19¾	10.8
Eaton 17221 (c) (d)	31	25¾	14.6

- On a C-Series truck, the dipstick should be removed through the opening in the panel behind the seat back cushion with the cab in its normal position.
- If hubs have been removed, an additional ½ pint of axle lubricant must be added. Add lubricant through the axle vent.
- If hubs have been removed, an additional 1 pint of axle lubricant must be added. Add lubricant through the axle vent.
- Quantities listed are approximate. Axle should be filled until lubricant is level with bottom of filler, hole with vehicle in normal operating position.

800-900, 8000-9000 SERIES TRUCKS

Make and Model		Approximate Capacity		
		U.S. Pints (a)	Imperial Pints	Litres
Tandem Axles				
Eaton 34DSC, 34DSE 34DPC, 34DTE (c) (e)	Forward	32.0	26.5	15.1
	Rearward	29.5	24.0	13.9
	Power Divider	2.0	1¾	0.9
Eaton 38DSC 38DTC 38DSE 38DPC (d) (e)	Forward	32.0	26.5	15.1
	Rearward	29.5	25.5	13.9
	Power Divider	2.0	1¾	0.9
Rockwell SLHD (c) (e)	Forward	32.5	27.0	15.3
	Rearward	32.0	26¾	15.1
	Power Divider	2.0	1¾	0.9
Rockwell SQHD (d) (e)	Forward	32.5	27.0	15.2
	Rearward	32.0	26¾	15.1
	Power Divider	2.0	1¾	0.9
Eaton DP440-P (d) (e)	Forward	43.5	35.7	20.3
	Rearward	34.5	28.5	16
	Power Divider	2.0	1¾	0.9
Single Speed Axle				
Eaton 17121 (c) (e)		31.0	25¾	14.6
Eaton 18121 (d) (e) & 22121		33.5	27¾	15.8
Eaton 23121 (d) (e)		36.0	29¾	17.0
Rockwell H-170 (b)		27.0	22¾	12.7
Rockwell R-170		44.5	36¾	21.0
Two Speed Axle				
Eaton 16244 (b) (e)		23.0	19.0	10.8
Eaton 17221 (b) (e)		31.0	26.0	14.6
Eaton 18221 (d) (e) 22221		33½	32¾	15.8
Eaton 23221		36.0	30.0	17.0
Rockwell SRDD	Forward	22.0	18¾	10.4
	Rearward	22.0	18¾	10.4
	Power Divider	2.0	1¾	0.9
Rockwell SUDD	Forward	—	—	—
	Rearward	—	—	—
	Power Divider	2.0	1¾	0.9
Rockwell SFDD	Forward	28.0	23½	13.2
	Rearward	28.0	23½	13.2
	Power Divider	2.0	1¾	0.9

- Add two pints of lubricant to inter-axle differential housing in addition to the specified amount when a new or reconditioned drive unit is installed.
- If hubs have been removed an additional ½ pint of axle lubricant must be added. Add lubricant through the axle vent.
- If hubs have been removed an additional 1 pint of axle lubricant must be added. Add lubricant through the axle vent.
- If hubs have been removed an additional 1½ pints of axle lubricant must be added. Add lubricant through the axle vent.
- Quantities listed are approximate. Axle should be filled until lubricant is level with the bottom of the filler hole with vehicle in normal operating position.

SPECIAL TOOLS

Number	Description
Tool 1175 AC	Seal Remover
T50T-100-A	Slide Hammer
T59T-1197-B	Front Wheel Bearing Adjusting Spanner Wrench
T75-1225 A or B	Front Wheel Bearing Replacer
T75T-1176 A or E	Rear Axle Threaded Draw Bar
T75T-1175 A or E	Rear Axle Seal Replacers
T70T-4252 P or E	Rear Axle Lock Nut Wrench
120072, 120211 or 120240	Wheel Bearing Packer
140030	Heavy Duty Wheel Dolly

CY1985-1A

Clutch and Manual Transmissions

PART 50-16

APPLIES TO ALL MODELS

SUBJECT	PAGE	SUBJECT	PAGE
LUBRICATION		MAINTENANCE	
Change Lubricant in Manual Shift or	16-2	Check and Adjust Clutch Pedal	
Auxiliary Transmissions — 600 through 9000		Travel — Hydraulic Clutch	
Series (Spicer SST Transmission)	16-2	C-Series	50-16-6
Clutch Equalizer	50-16-1	P-600	50-16-6
Clutch Linkage Pivots and		Check and Adjust Clutch Pedal	
Clevises	50-16-1	Travel — Mechanical Linkage —	
Clutch Pedal Pivot Shaft	50-16-2	E-100 — E-350	50-16-5
Clutch Release Bearing	50-16-2	F-100 — F-350	50-16-5
Drain and Refill Manual		F- and B-7000	50-16-5
Transmissions — F-100 — F-350,		L-Series	50-16-5
E-100 — E-350, Bronco	50-16-2	Clutch Hydraulic System Bleeding	
Drain and Refill — NPG 203		Method — All Vehicles	50-16-6
Full-Time Transfer Case	50-16-3	Gravity Bleeding Method	50-16-6
Drain and Refill NPG 205		Pressure Tank Bleeding	50-16-6
Part Time Transfer Case	50-16-3	Internal Adjustment —	
Drain, Flush and Refill		Multiple Disc Type Clutch	50-16-3
Fuller Transmissions	50-16-2	Replace Air Regulator and	
Drain, Flush and Refill		Filter Element — Fuller	
Spicer 16-Speed Transmission	50-16-2	Transmission	50-16-3
Fuller Transmission Air Cylinder		Replace Spicer 16-Speed	
Shift Lever and Linkage	50-16-2	Transmission Air Filter	
Manual Transmission Lubricant		Element	50-16-3
Level and Clean Breather		Torques	50-16-6
(Main and Auxiliary)	50-16-2	Transmission and	
Transfer Case Fluid Level		Auxiliary Transmission	
(4-Wheel Drive)	50-16-3	Mountings	50-16-6
Transmission Linkage Pivots	50-16-2	PRE-DELIVERY	50-16-1
Transmission Remote Gearshift		SPECIFICATIONS	50-16-19
and Auxiliary Transmission			
Linkage, Cables and U-Joints	50-16-2		

PRE-DELIVERY

Refer to Part 50-02.

LUBRICATION

CLUTCH LINKAGE PIVOTS AND CLEVISES

Lubricate all clevis pins and pivot points sparingly with SAE 10W engine oil.

CLUTCH EQUALIZER

Wipe the lubrication fitting clean on the clutch equalizer (where so equipped), and apply chassis lube as specified in the lubricants chart (Part 50-03).

CLUTCH PEDAL PIVOT SHAFT

On all apply SAE 10W oil to the clutch shaft.

CLUTCH RELEASE BEARING

Apply lubricant to the pressure grease fitting on the bearing hub (all medium duty vehicles equipped with super duty or diesel engines). **Do not use ordinary chassis lubricant. Do not over-lubricate.** Use only high temperature lubricant meeting Ford Specifications (Part 50-03).

TRANSMISSION LINKAGE PIVOTS

Lubricate all clevis pins and pivot points with SAE 10W engine oil. Wipe the lubrication fitting on the first and reverse shift lever at the lower end of steering column and apply specified chassis lube (above -12.2°C or 10°F) or calcium soap grease (below -12.2°C or 10°F). Refer to the Lubricant Specification in Part 50-03.

TRANSMISSION REMOTE GEAR SHIFT AND AUXILIARY TRANSMISSION LINKAGE, CABLES AND U-JOINTS

For prevailing temperatures above -12.2°C (10°F), apply the specified chassis lubricant (Part 50-03), with a pressure gun to transmission remote gear shift front cross-shaft and levers, auxiliary transmission linkage, and transmission cables, U-joints, crank arm and side bushings (C-Series only).

For prevailing temperatures below -12.2°C (10°F) use calcium soap grease (conforming to Ford Specification in Part 50-03).

FULLER TRANSMISSION AIR CYLINDER SHIFT LEVER AND LINKAGE

Apply specified chassis lubricant (Part 50-03 Lubrication Charts and Lubricant Specifications) to linkage connections with pressure gun.

MANUAL TRANSMISSION LUBRICANT LEVEL AND CLEAN BREATHER (MAIN AND AUXILIARY)

1. Remove fill plug from the side of the case.
2. If lubricant does not flow from the fill hole, fill the case with the specified lubricant (Part 50-03) until it is level with the bottom of the fill hole.
3. Install the filler plug.
4. Clean all dirt from the breather.

DRAIN AND REFILL MANUAL TRANSMISSION—F-100—F-350, E-100—E-350, BRONCO

(For repair only. Not recommended to change lube in Tremec 3 and 4 Speed transmissions.)

1. Remove the speedometer cable. On the Ford transmissions, remove the bottom housing bolts. Allow the lubricant to drain.
2. Install the drain plug after the case is completely

drained. On Ford transmissions, tighten the bottom housing bolt to 57-67 N·m (42-50 ft-lbs).

3. Fill the case with the specified lubricant (Part 50-03) through the speedometer cable hole or filler plug hole on Tremec transmissions until the fluid is level with the lower edge of the cable or filler hole.
4. Install the fill plug.

CHANGE LUBRICANT IN MANUAL SHIFT OR AUXILIARY TRANSMISSIONS—600 THRU 9000 SERIES (SPICER SST TRANSMISSION)

1. Remove the filler plug and drain plug, and let the old lubricant run out. Thoroughly flush the case with clean flushing oil or kerosene.
2. Install the drain plug.
3. Refill the case until the new lubricant is level with the bottom of the filler plug hole; then, install the filler plug.
4. The Spicer SST Transmission has two filler holes and two drain plugs.

DRAIN, FLUSH AND REFILL FULLER TRANSMISSIONS

1. When the transmission is warm, remove the drain plug at the bottom of the case and drain the oil.
2. Clean the drain plug and replace it.
3. Remove all dirt from the area of the filler plug opening on the left side of the case, and remove the filler plug.
4. Fill the transmission with a clean flushing oil or kerosene to the level of the filler plug opening. Install the filler plug. **On off-highway equipment, remove the lubricating pump before flushing.**
5. With the transmission in **NEUTRAL**, run the engine at fast idle for a period of 10 seconds.
6. Remove the drain plug, drain the flushing oil, and replace the plug.
7. Remove the filler plug, fill the transmission with engine oil SAE 50 above -12.2°C or 10°F, or SAE 30 below 10 degrees F or -12.2 degrees C, to the level of the filler opening, and replace the plug. **Do not over-fill. Over-filling will cause oil to be forced out of the case through the mainshaft openings.**

TRANSFER CASE FLUID LEVEL CHECK (4-WHEEL DRIVE)

1. Remove the fill plug from the case.
2. If lubricant does not flow from the fill hole, fill the case with the specified lubricant (Part 50-03) until it is level with the bottom of the fill hole.
3. Install the fill plug.

DRAIN AND REFILL NPG 208 PART TIME AND BORG WARNER 1345 TRANSFER CASE

1. Remove the filler plug from the rear top case half.
2. Remove the drain plug from the rear bottom case half, and allow the old lubricant to drain out.

3. Clean and install the drain plug after the case is completely drained.
4. Fill the case with the specified lubricant (Part 50-03

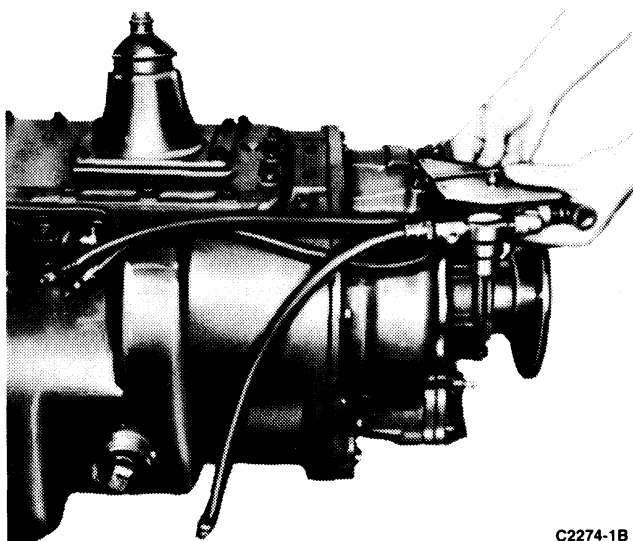
Lubrication Charts and Lubricant Specifications), until it is level with the lower edge of the filler hole.

5. Install the filler plug.

MAINTENANCE

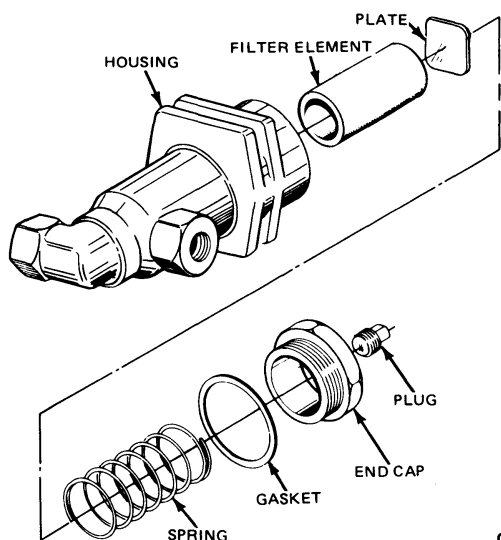
REPLACE AIR REGULATOR AND FILTER ELEMENT—FULLER TRANSMISSION

1. Disconnect and remove air line between the air regulator and splitter cylinder cover.
2. Disconnect and remove the air lines from the air valve on side of transmission.
3. Turn out the capscrews that attach the filter bracket to the transmission. Remove filter, regulator and air line from transmission (Fig. 1). The air filter contains a replaceable filter element which can be removed by detaching the end cap at top of filter and disengaging the body from the end cap. (Fig. 2).



C2274-1B

FIG. 1 Removing Air Regulator and Filter



C2753-1A

FIG. 2 Air Filter Assembly

4. The air regulator is not serviceable. If defective, replace the air regulator unit.
5. Install nipple in output port of air filter.
6. Install air regulator on nipple.
7. Install regulator and filter on mounting bracket with clamp.
8. Install nipple and "T" in regulator.
9. Install the air filter and regulator bracket on auxiliary housing.
10. Install 1/4-inch inside diameter air line between bottom port of "T" in regulator and supply port in splitter cylinder.
11. Install 1/4-inch air line between regulator and air valve supply port. Install 1/4-inch air line between rear port in side cap of air valve and range shift cylinder cover. Install 1/4-inch air line between air valve and range cylinder.

INTERNAL ADJUSTMENT—MULTIPLE DISC TYPE CLUTCH

The linkage on a 14 or 15-1/2 inch multiple disc clutch should not be adjusted to compensate for clutch facing wear. Linkage should be reset to provide proper free-pedal only after the internal clutch adjustment has been made. Proper linkage settings are given at the end of this Part.

1. To make an internal clutch adjustment, remove the inspection cover from the bottom of the clutch housing.
2. Disconnect the retracting spring. Holding the release lever against the release bearing, measure the distance between the release bearing and the clutch spring hub on models with a synchronized transmission.

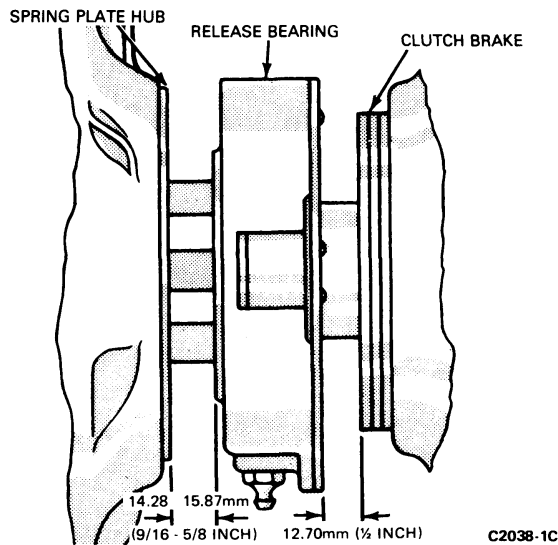
On models with non-synchronized transmissions, measure the distance between the release bearing and the clutch brake.

On vehicles equipped with a 14 inch or 15-1/2 inch two plate clutch, the dimension between the release bearing and the clutch spring plate hub should be 14.28-15.87mm (9/16-5/8 inch). The dimension between the release bearing the clutch brake should be 12.7mm (1/2 inch) (Fig. 3).

On vehicles equipped with a 14 inch single plate clutch, the dimension between the release bearing and the clutch spring hub should be 8.73-10.31mm (11/32-13/23 inch).

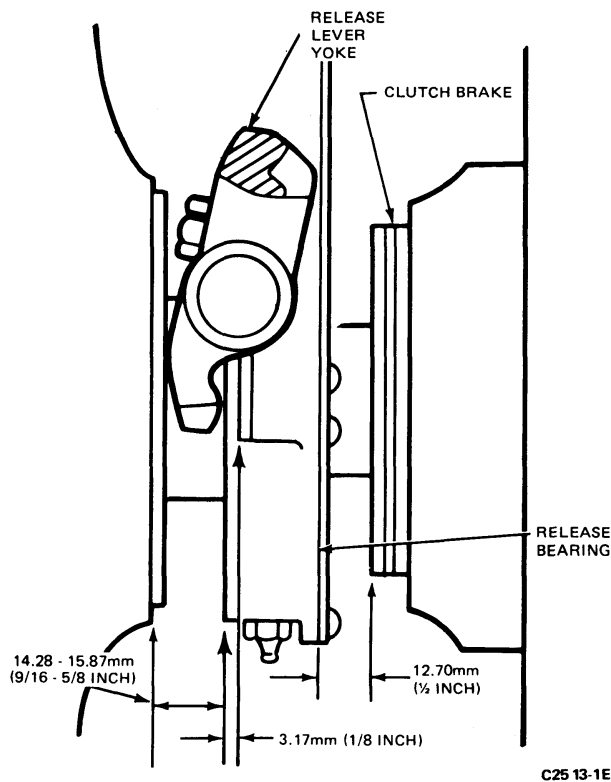
On all spicer type clutches, also adjust the adjusting ring to provide a 3.17mm (1/8 inch) clearance between the release yoke fingers and the release bearing (Fig. 4).

3. Adjust the clutch assembly by rotating the engine flywheel until the adjusting ring lock and bolt are exposed. Remove the bolt and lock (Fig. 5).



C2038-1C

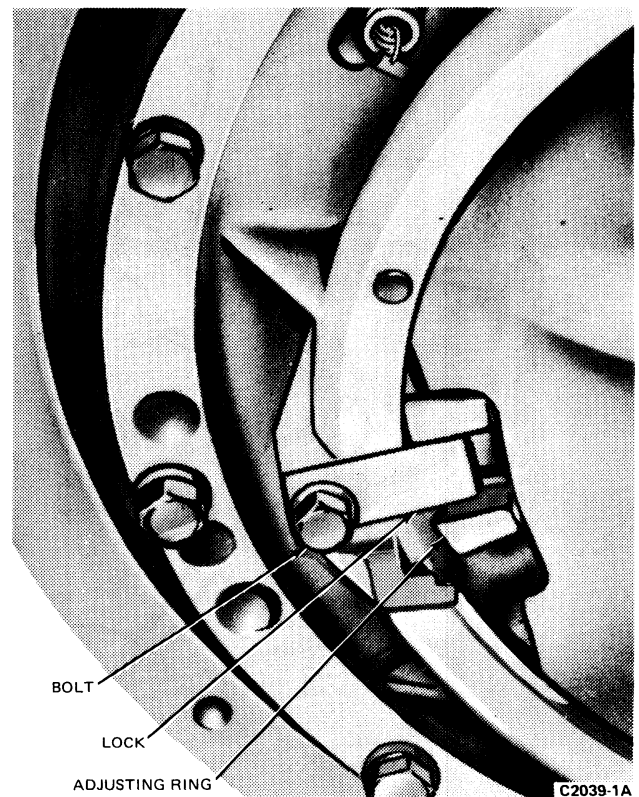
FIG. 3 Adjustment Dimensions—14 Inch Double-Disc Clutch



C25 13-1E

FIG. 4 Adjustment—Spicer-Type Clutch

4. Hold or block the clutch pedal in the released position.
5. Use a pry bar to turn the adjusting ring (Fig. 5) counterclockwise (looking from rear of vehicle) to move the release bearing toward the flywheel, or clockwise to move the release bearing away from the flywheel. Rotation or movement of one lug position will move the release bearing approximately 0.79mm (1/32 inch).
6. Remove the clutch pedal block to engage the clutch.
7. Recheck the clearance and readjust as necessary.



C2039-1A

FIG. 5 Internal Adjustment—Spicer Type-Clutch

As a final check for proper clutch adjustment, measure the distance between the centerline of the pedal pad and the cowl panel in the engaged position. Proper internal adjustment should measure 82.55-88.90mm (3-1/4-3-1/2 inch). Otherwise, repeat Steps 2 to 5, and remeasure.

8. After the clutch has been properly adjusted, install the lock and bolt.
9. Recheck the slave cylinder push rod-to-release lever clearance, if so equipped.
10. Connect the retracting spring and install the inspection cover on the clutch housing.

CHECK AND ADJUST CLUTCH PEDAL TRAVEL—MECHANICAL LINKAGE

E-100—E-350, F-100—F-350 AND BRONCO

1. Refer to Figs. 6, 7 and 9 for adjustment points. Pedal total travel is fixed in this series and is not adjustable.
2. Measure the clutch pedal free travel using a steel tape (Fig. 8). Measure the distance from the clutch pedal pad to the steering wheel rim. Depress the pedal slowly until the free travel between the release bearing assembly and the pressure plate assembly is taken up. Note this measurement. The difference between the two measurements is the free travel.
3. If the free travel measurement is less than 12.7mm (1/2 inch) or more than 50.8mm (2 inch) the clutch linkage must be adjusted.
4. Remove clutch return spring and loosen the two jam

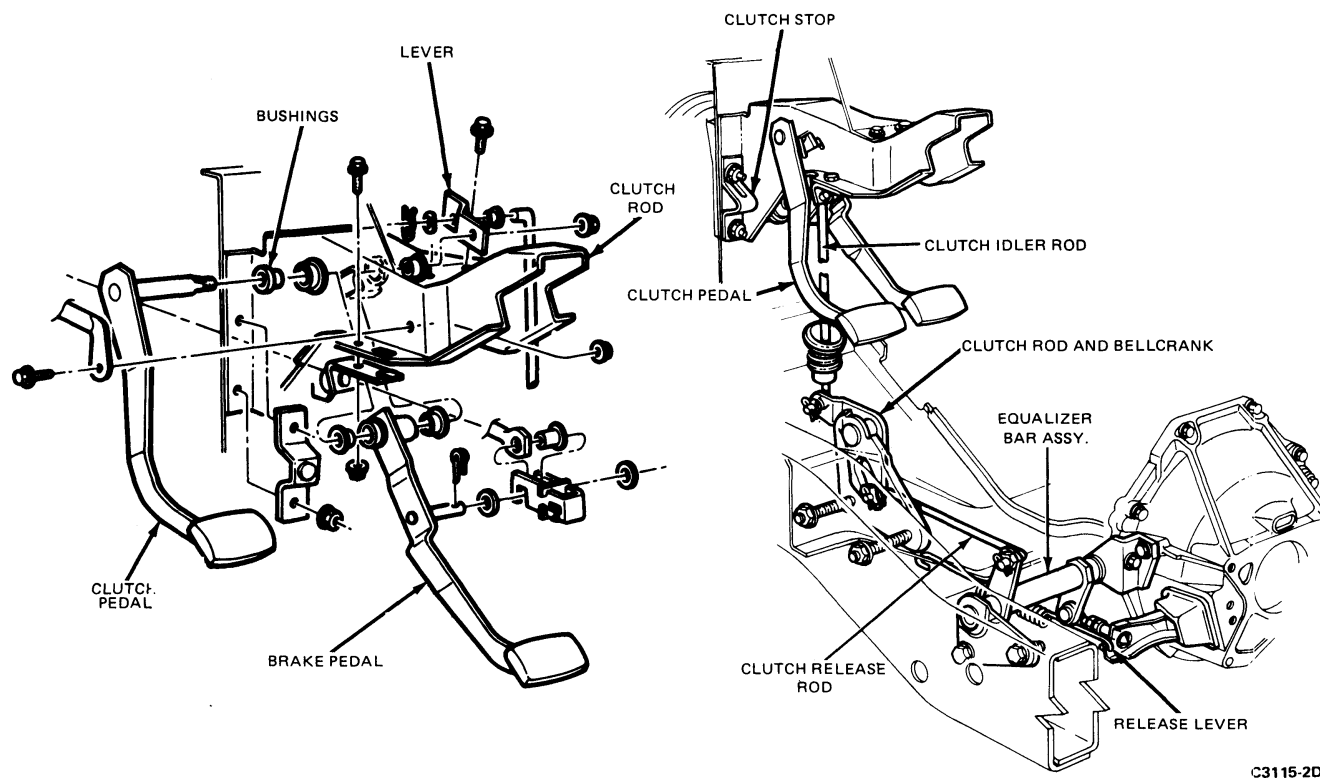


FIG. 6 Clutch Mounting and Linkage—E-100—E-350

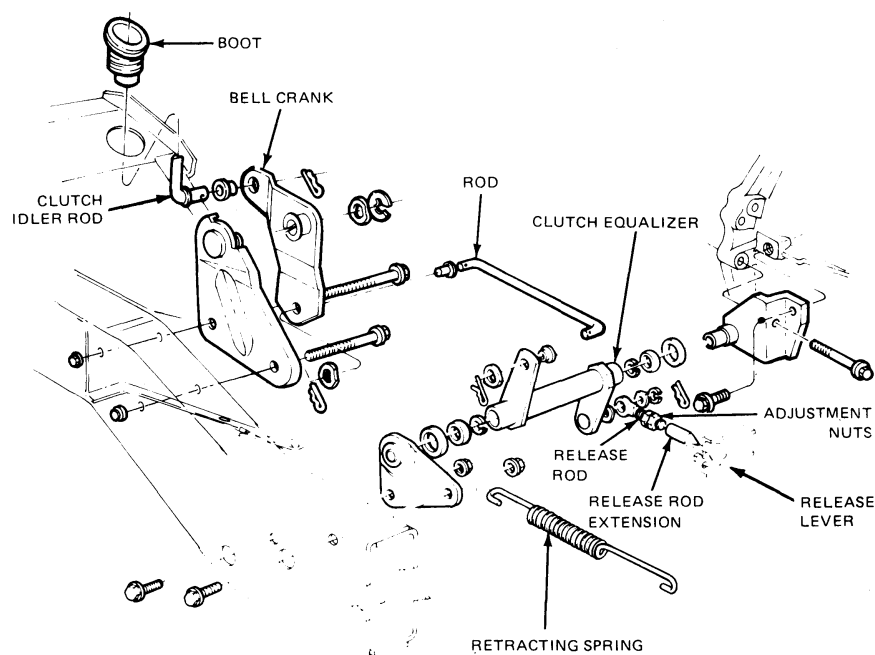


FIG. 7 Clutch Equalizer Shaft—E-100—E-350

nuts on the release rod assembly (Fig. 7) and back off both nuts several turns.

5. Adjust the first jam nut against the release rod extension (bullet) until a pedal free travel of 50.8mm (2 inch) is obtained. (One turn of the nut equals approximately 6.35mm (1/4 inch) at the pedal.)
6. With the recommended free travel obtained, and

holding the first jam nut, position and securely tighten the second jam nut against the first jam nut.

7. Recheck the pedal free travel.
8. Reinstall the clutch return spring.

F- AND B-600—700

1. Adjust the clutch pedal stop to set total pedal travel

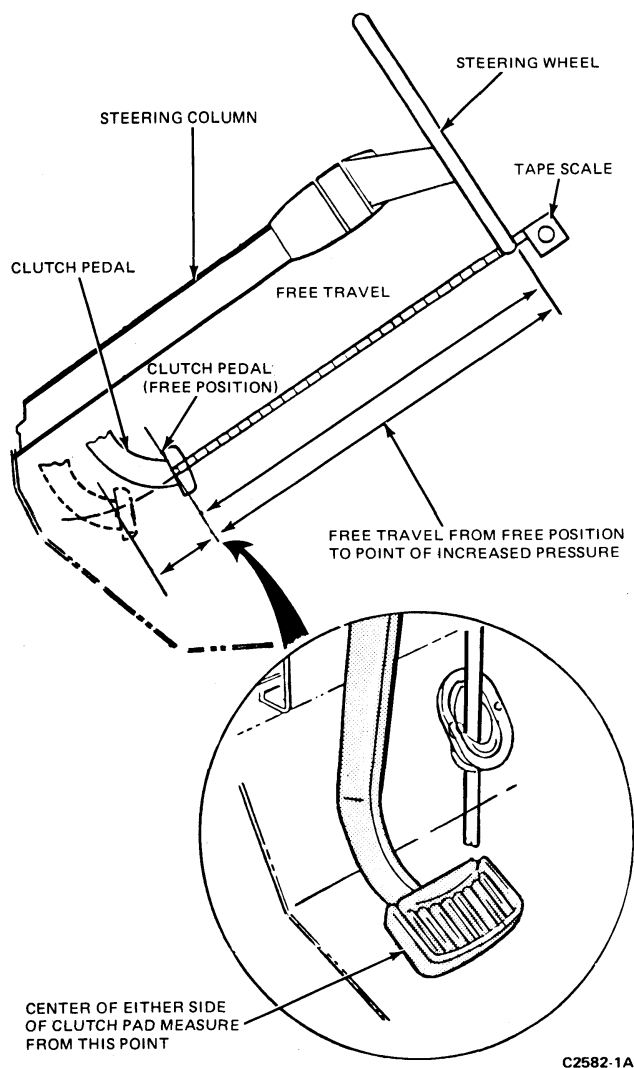


FIG. 8 Measuring Free Travel

to within 200mm (7 7/8 inches) (Figs. 10 and 11). Tighten the stop nut to specification.

2. On diesel-engine models, adjust the clutch pedal free travel to specification by loosening the jam nut and backing off the set screw in the 7511 lever to compensate for clutch face wear. There should be 3.57mm (9/64 inch) clearance between the B590 sleeve and the 7511 lever.
3. Tighten the jam nut.
4. On gas-engine models, adjust the clearance between the nut and lever as shown in Fig. 11. Clearance should be 0.35mm (1/4 inch).
5. Tighten the jam nut.

L-SERIES

A common pedal is used on all L-Series trucks (Fig. 12). Refer to Fig. 12 for instructions on adjusting pedal total travel and dimension locations for installation and free pedal measurements.

Refer to the appropriate illustrations (Figs. 13 thru 18), for linkage and clutch free pedal adjustments. Note that it is not necessary to set the total clutch linkage each time the clutch is adjusted for pedal free travel.

Also note that double disc Spicer-type clutches are adjusted internally for pedal free travel. **This procedure must be used on these clutches to prevent premature clutch failure.**

CHECK AND ADJUST CLUTCH PEDAL TRAVEL—HYDRAULIC CLUTCH

Before making any adjustments, be sure the system is free of air and the master cylinder fluid is at the specified level.

C-SERIES

Adjust the C-Series clutch pedal and clutch slave cylinder per the instructions shown in Fig. 19.

CLUTCH HYDRAULIC SYSTEM BLEEDING METHOD—ALL VEHICLES

There are two methods for bleeding clutch hydraulic systems with a minimum loss of hydraulic fluid.

PRESSURE TANK BLEEDING

1. Connect a transparent bleeder hose to the pressure tank hose connector. Attach the bleeder hose to the slave cylinder bleeder screw and fill the empty cylinders.
2. Adjust pressure tank fluid flow so the master cylinder does not fill too fast and cause spillage, because a stream of fluid will be expelled from the small relief port of conventional type cylinders.
3. Close the bleeder screw on the slave cylinder when the fluid in the master cylinder reservoir is approximately 1/2 inch from the top. No further bleeding should be necessary, since all the air in the system would exhaust through the master cylinder relief port.
4. Check the slave cylinder push rod total travel, which should be at least 1-1/8 inch.

The clutch master cylinder relief port must be open in order to bleed the system.

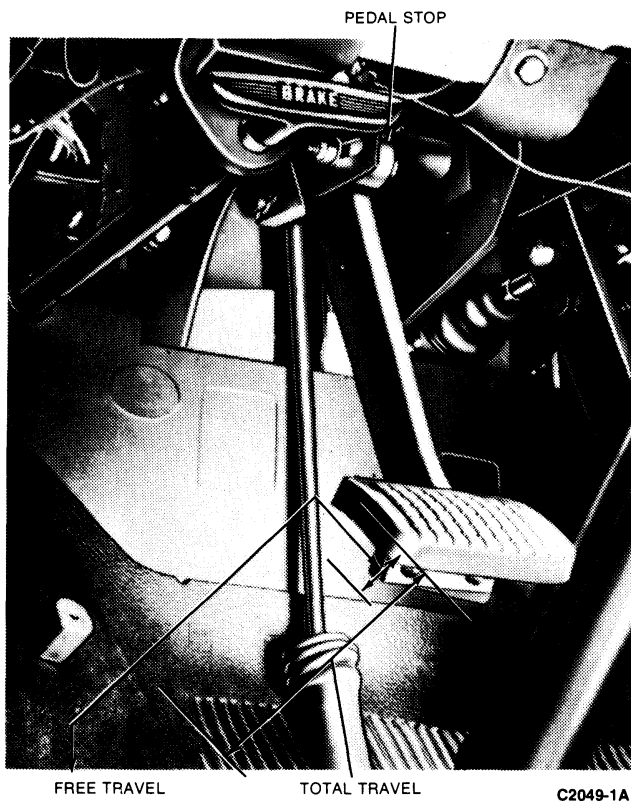
In C-Series, the O-ring seal on the end of the push rod must not seat against the piston. Uncovering of the piston port is accomplished by adjustment of the push rod to a piston lash of 1/4 inch. Forcing the clutch pedal to compress the pedal bumper more than normal by jamming a screwdriver between the pedal pad and the floor insures a complete uncovering of the relief port.

GRAVITY BLEEDING METHOD

1. Attach a funnel to a transparent bleeder hose. Attach the hose to the bleeder screw of the slave cylinder. The funnel must be higher than the master cylinder. Pour hydraulic fluid in the funnel as the system is filling. Do not agitate the fluid in order to prevent formation of air bubbles.
2. Follow Steps 3 and 4 as described under Pressure Tank Bleeding.

TRANSMISSION AND AUXILIARY TRANSMISSION MOUNTINGS

If the vehicle is operated on rough terrain, this check should be made frequently. If mounting bolts are loose, torque to specifications. If insulators are worn or frayed, replace them.



C2049-1A

FIG. 10 Clutch Pedal Travel**TORQUES**

Tighten all attaching bolts and nuts at the intervals outlined in the Maintenance Schedules (Part 50-02) to the torque specified in the Specifications Section.

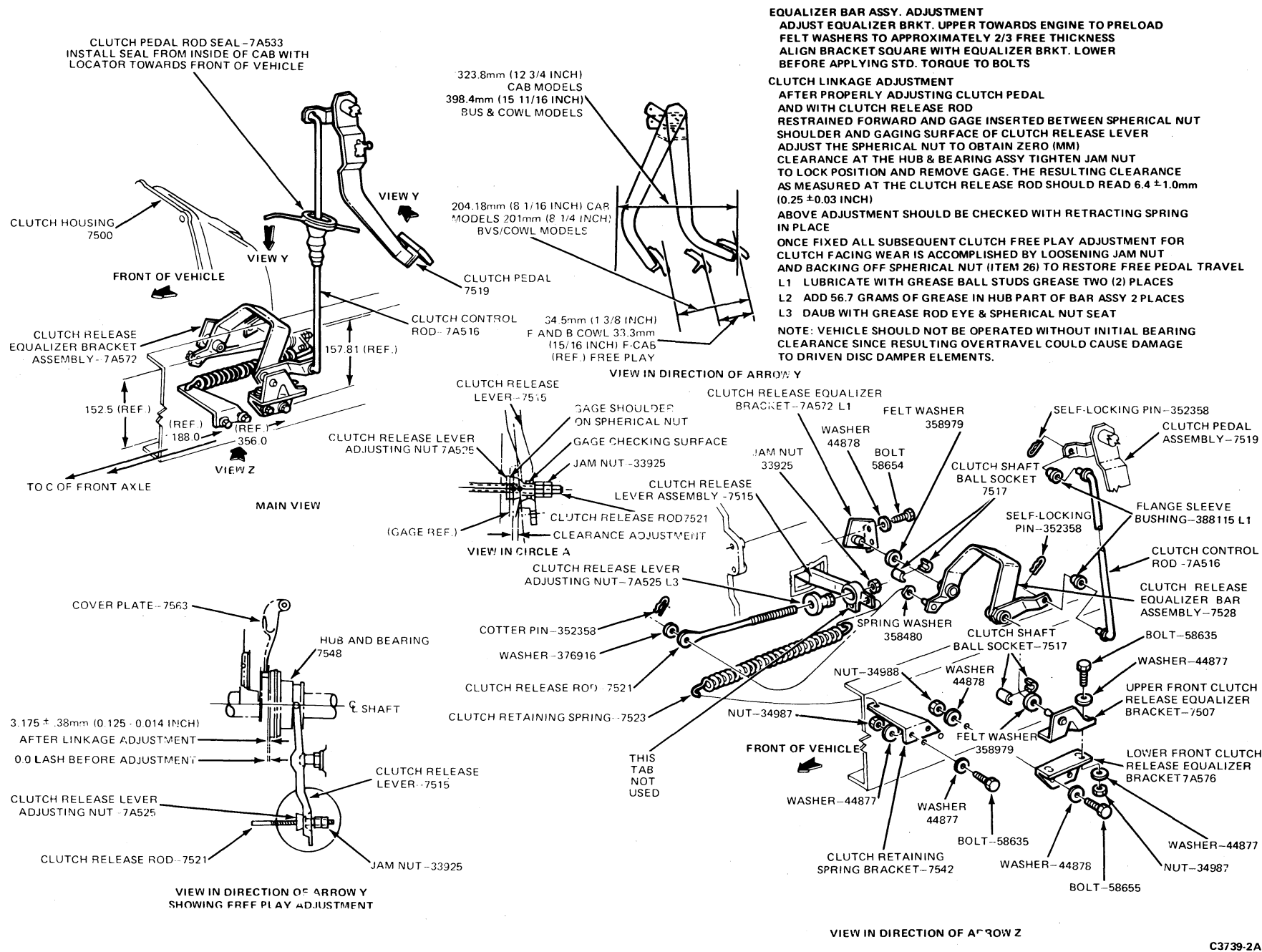
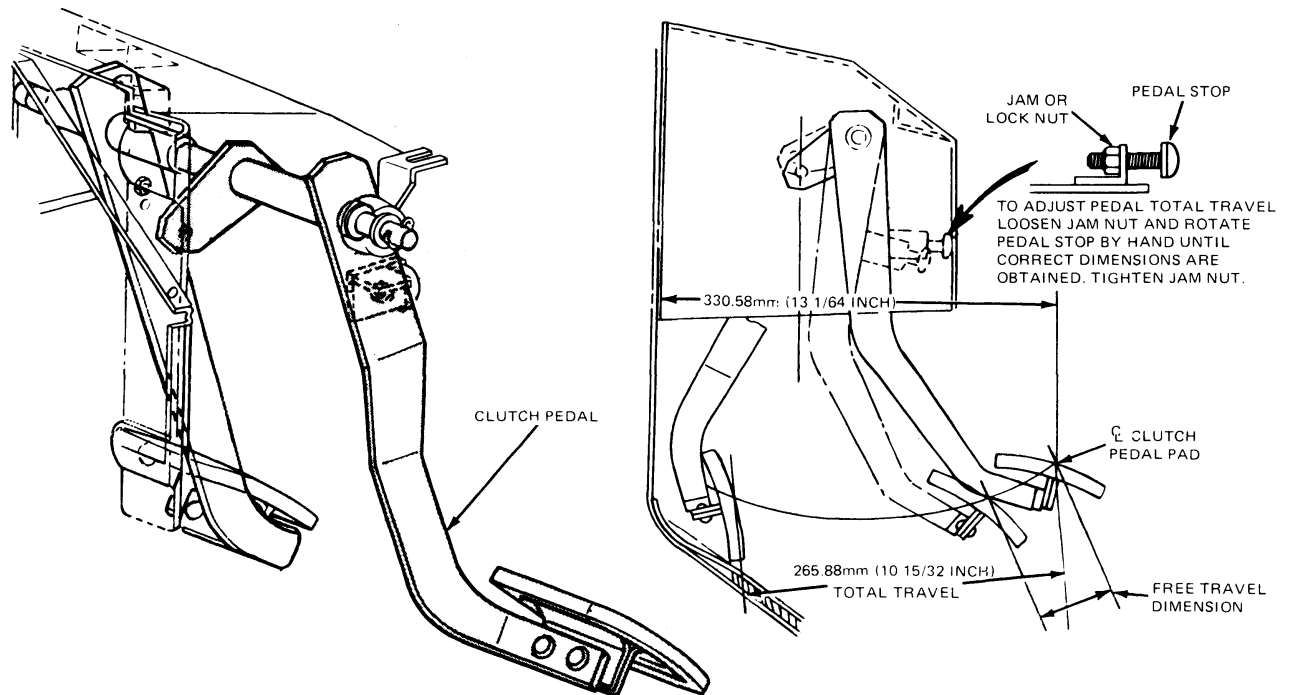


FIG. 11 Clutch Adjustments—F and B-600—700



C2598-2E

FIG. 12 Clutch Pedal All L-Series

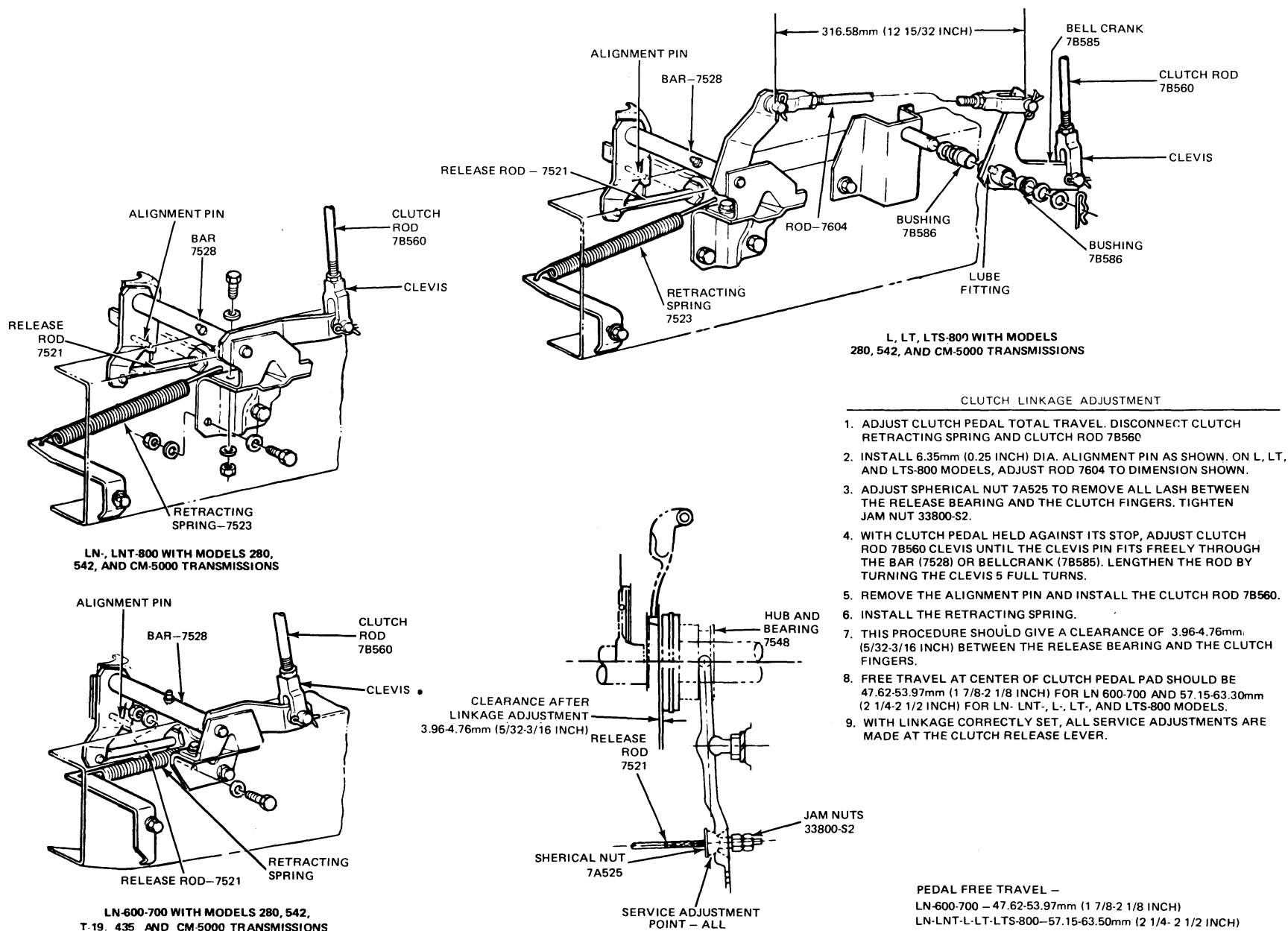
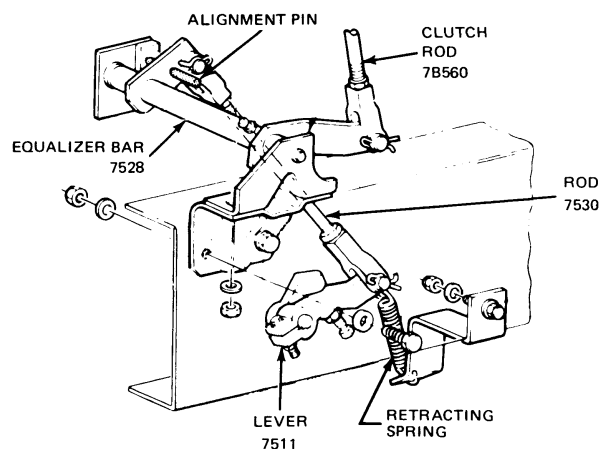
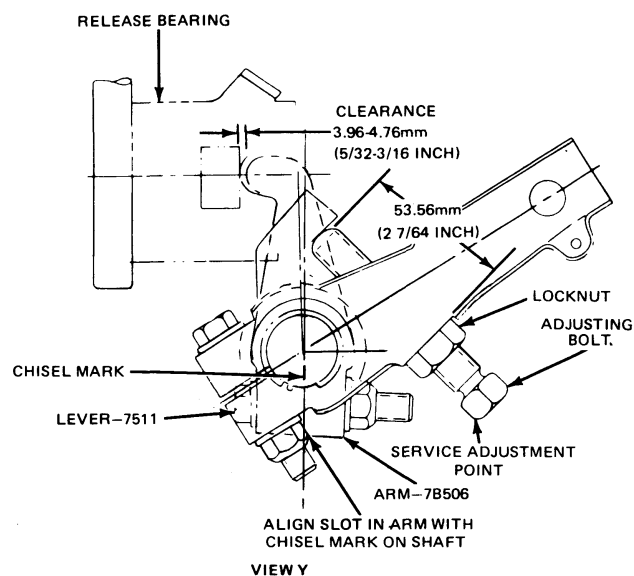


FIG. 13 Clutch and Linkage—LN-600—700, L-, LT-, LN-, LNT-, LTS-800 with Gas Engines

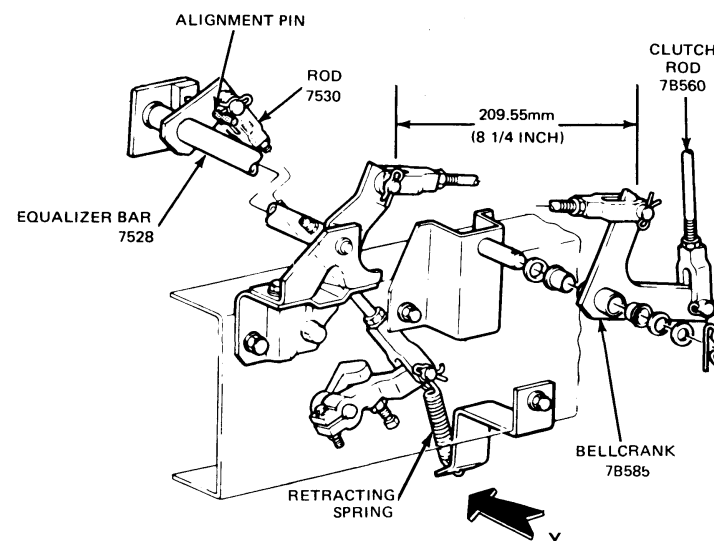
FOR CLUTCH PEDAL FREE TRAVEL SEE
SPECIFICATIONS AT THE END OF THIS PART



LN, LNT-800-900 WITH GAS ENGINE
AND RT-610, RT-613 TRANSMISSIONS

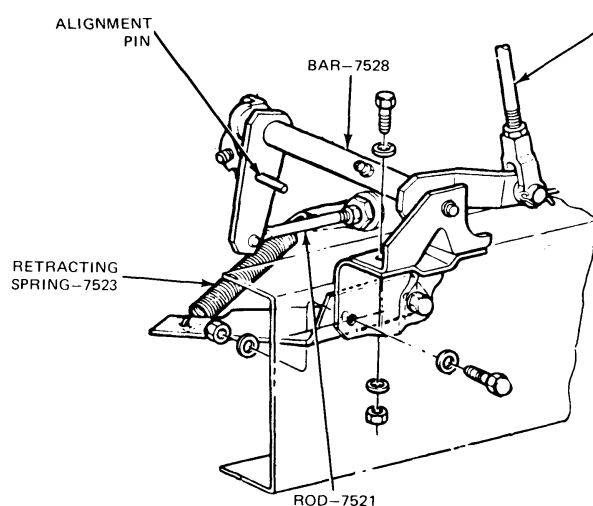
CLUTCH LINKAGE ADJUSTMENT

1. DISCONNECT RETRACTING SPRING
2. ADJUST CLUTCH PEDAL TOTAL TRAVEL AND CLUTCH RELEASE BEARING CLEARANCE
3. DISCONNECT CLUTCH ROD 7B560 AT EQUALIZER BAR 7528 OR AT BELL CRANK 7B585 AND INSTALL 0.25 INCH DIA. ALIGNMENT PIN AS SHOWN
4. ADJUST ROD 7530 TO SECURE ZERO RELEASE BEARING LASH WHERE APPLICABLE. BE SURE BAR-TO-BELL CRANK ROD DIMENSION IS AS SHOWN
5. WITH THE PEDAL HELD AGAINST ITS STOP, ADJUST CLUTCH ROD 7B560 UNTIL THE CLEVIS PIN FITS FREELY IN BAR 7528 OR BELL CRANK 7B585
6. REMOVE THE ALIGNMENT PIN
7. LENGTHEN CLUTCH ROD 7B560 5 TURNS AND CONNECT TO BAR 7528 OR BELL CRANK 7B585. CONNECT RETRACTING SPRING
8. CHECK RELEASE BEARING CLEARANCE, WHICH SHOULD BE AS SHOWN. IT IS NOT NECESSARY TO ADJUST CLUTCH LINKAGE EACH TIME THE PEDAL FREE TRAVEL IS ADJUSTED. MAINTAIN PEDAL FREE TRAVEL BY ADJUSTING AT THE POINT SHOWN

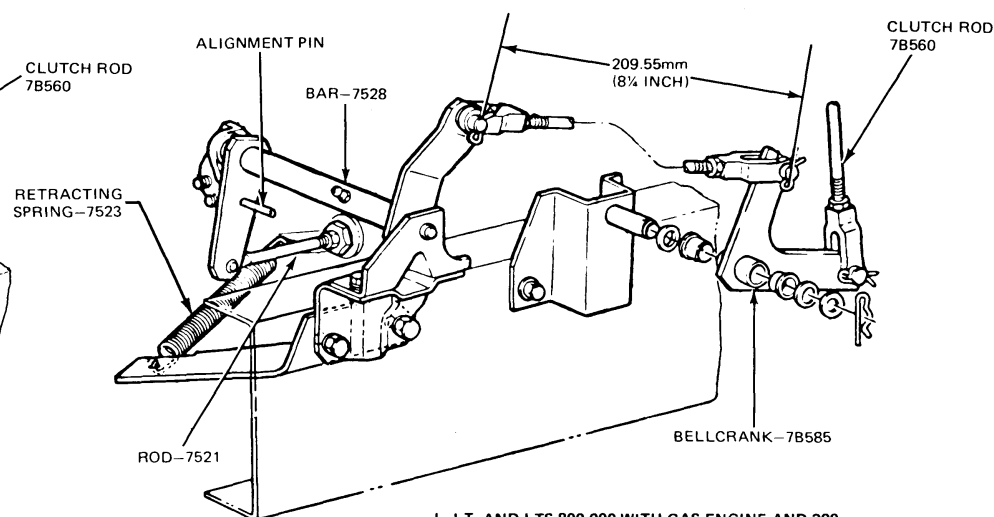


L-, LT-, LTS-800-900 WITH GAS ENGINE
AND RT-610, RT-613 TRANSMISSIONS

FIG. 14 Clutch and Linkage—L-, LN-, LT-, LNT-, LTS-800-900, with Gas Engine and Model RT-610, RT-613 Transmission



LN-LNT-800-900 WITH GAS ENGINE AND 390, CM-5000 AND CM-6000
SERIES TRANSMISSIONS



L-, LT- AND LTS-800-900 WITH GAS ENGINE AND 390,
CM-5000 AND CM-6000 SERIES TRANSMISSIONS
LT-800 AND 390 AND CM-60 TRANSMISSION

CLUTCH LINKAGE ADJUSTMENT

1. DISCONNECT RETRACTING SPRING 7523
2. ADJUST CLUTCH PEDAL TOTAL TRAVEL AND RELEASE BEARING CLEARANCE.
3. DISCONNECT CLUTCH ROD 7B560 AT EQUALIZER BAR 7528 OR AT BELL CRANK 7B585 AND INSTALL 6.35mm (1/4 INCH) DIA. ALIGNMENT PIN.
4. ADJUST ROD 7521 TO SECURE ZERO RELEASE BEARING LASH. BE SURE THAT BAR-TO-BELL CRANK ROD DIMENSION IS AS SHOWN (WHERE APPLICABLE).
5. WITH THE PEDAL HELD AGAINST ITS STOP, ADJUST CLUTCH ROD 7B560 UNTIL THE CLEVIS PIN FITS FREELY IN BAR 7528 OR BELL CRANK 7B585.
6. REMOVE THE ALIGNMENT PIN.
7. LENGTHEN CLUTCH ROD 7B560 5 TURNS AND CONNECT TO BAR 7528 OR BELL CRANK 7B585. CONNECT THE RETRACTING SPRING.
8. CHECK RELEASE BEARING CLEARANCE, WHICH SHOULD BE AS SHOWN. IT IS NOT NECESSARY TO ADJUST CLUTCH LINKAGE EACH TIME PEDAL FREE TRAVEL IS ADJUSTED. MAINTAIN PEDAL FREE TRAVEL BY ADJUSTING AT THE POINT SHOWN.

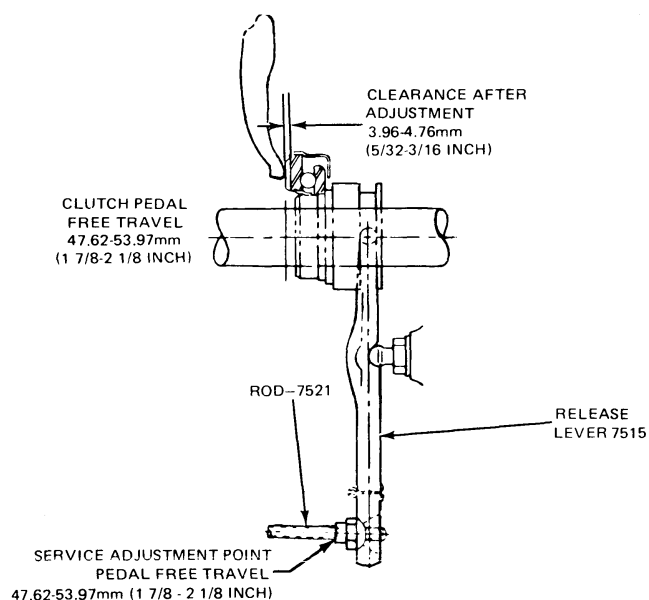


FIG. 15 Clutch and Linkage—LT-, LTS-, LNT-, -900 with Gas Engine and Models 390, Spicer CM-5000 and CM-6000 Transmissions

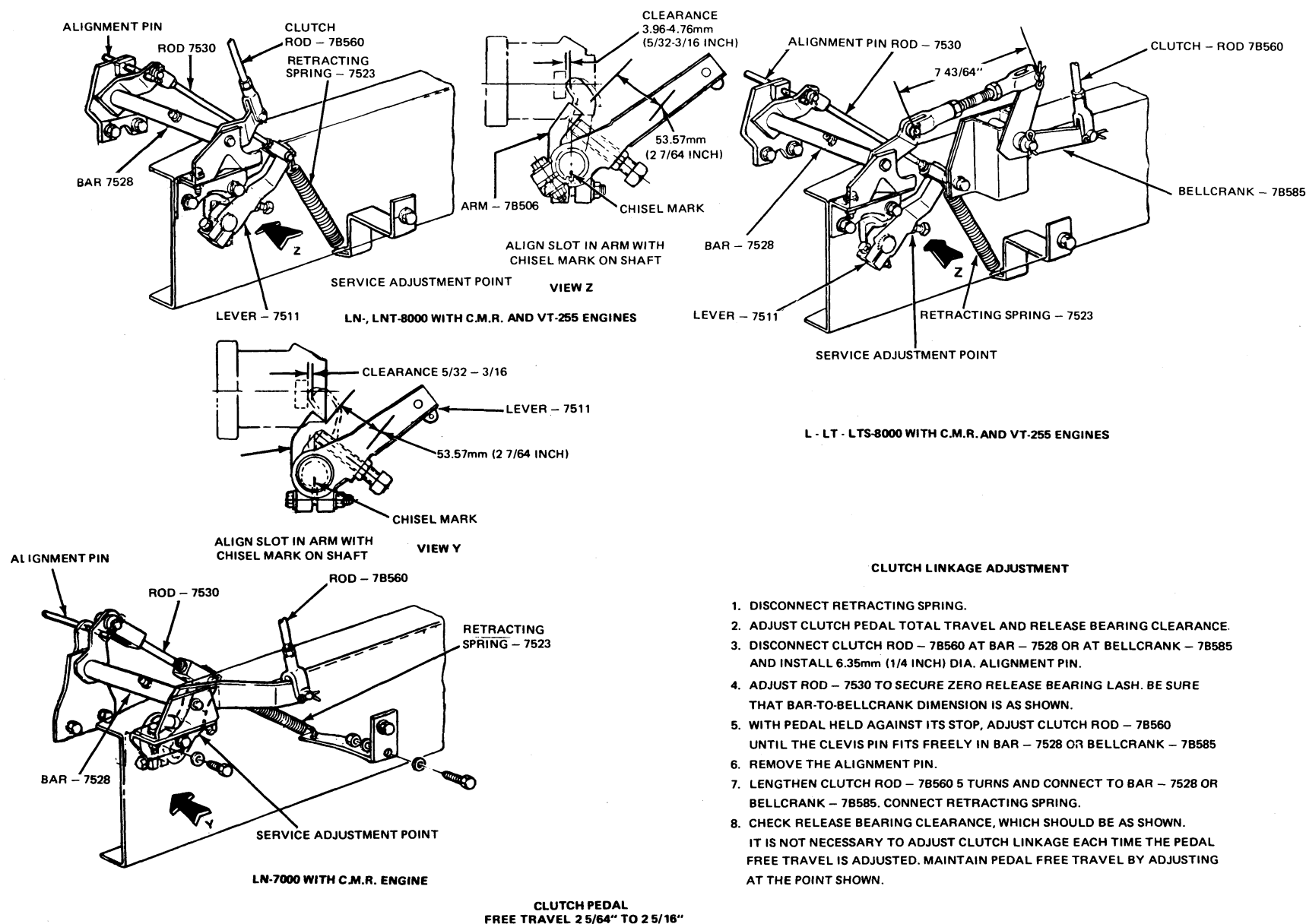


FIG. 16 Clutch and Linkage—LN-7000, L-, LN-, LTS-, LT-, LNT-, -8000 with Caterpillar V-8 and Cummins VT-225 Diesel Engines

CLUTCH LINKAGE ADJUSTMENT

AFTER CLUTCH AND CLUTCH PEDAL ADJUSTMENT ARE MADE, INSTALL (7511) CLUTCH RELEASE LEVER ON (7510) SHAFT WITH SLOT ALIGNED WITH CHISEL MARK AS SHOWN IN VIEW Z. FOR LN-LNT-9000 W/STRAIGHT FRAME, MARK ON LEVER WITH CHISEL. MARK ON SHAFT FOR LN-LNT-9000 W/DROP FRAME. TIGHTEN CLAMP BOLT.

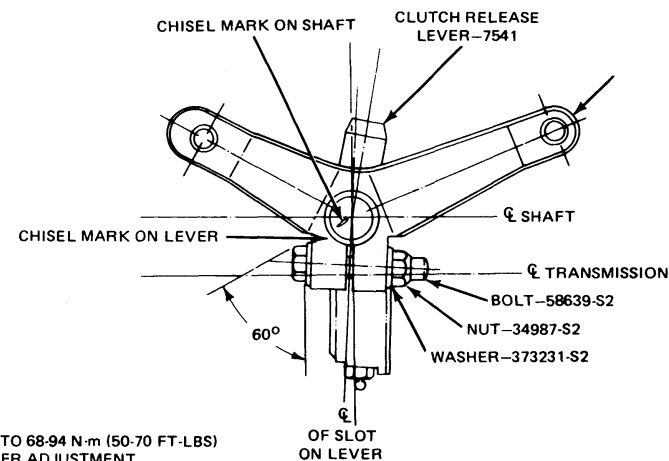
NOTE: TO ASSURE FREE MOVEMENT OF BAR ASSEMBLY (7528), ADJUST BRACKET ASSEMBLY—CLUTCH EQUALIZER UPPER (7507) SO THAT FELT WASHERS (358979) WILL BE COMPRESSED APPROXIMATELY 1/3 OF THEIR ORIGINAL THICKNESS. DO NOT OVERTIGHTEN.

INSTALL .25 DIAMETER GAUGE PIN THROUGH A HOLE IN (7528) BAR ASSEMBLY AND (7A572) BRACKET ASSEMBLY ON ENGINE TO RETAIN BAR ASSEMBLY.

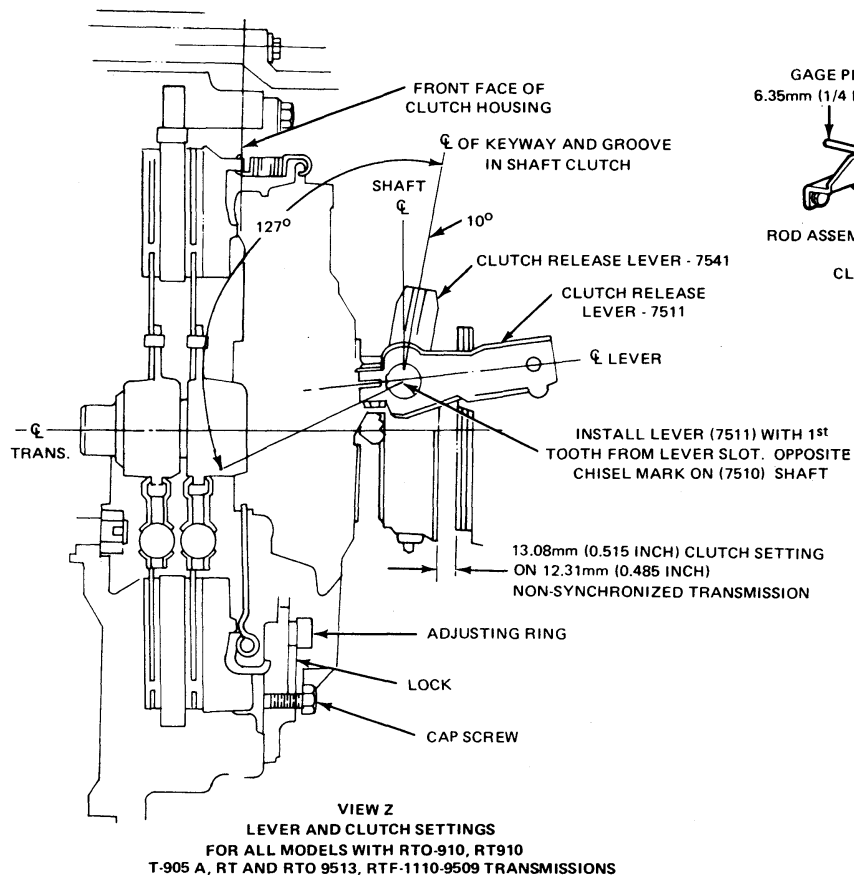
ROTATE (7511) CLUTCH RELEASE LEVER COUNTERCLOCKWISE UNTIL ZERO BEARING LASH IS ACHIEVED AND ADJUST (7530) ROD ASSEMBLY UNTIL CLEVIS PIN FITS FREELY IN (7511) CLUTCH RELEASE LEVER AND (7A572) BAR ASSEMBLY. SECURE CLEVIS PIN AND TIGHTEN JAM NUT TO SPECIFIED TORQUE.

INSTALL (7B560) ROD ASSEMBLY IN (7519) PEDAL ASSEMBLY WITH PEDAL ASSEMBLY HELD AGAINST ITS STOP, ADJUST (383536) CLEVIS ON (7B560) ROD ASSEMBLY UNTIL CLEVIS PIN FREELY FITS THROUGH (7528) LEVER IN BAR ASSEMBLY. LENGTHEN ROD ASSEMBLY BY TURNING CLEVIS 9.52mm (0.375 INCH) (5-TURNS). REMOVE 6.35mm (1/4 INCH) DIAMETER GAUGE PIN. INSTALL ROD ASSEMBLY AND TIGHTEN JAM NUT.

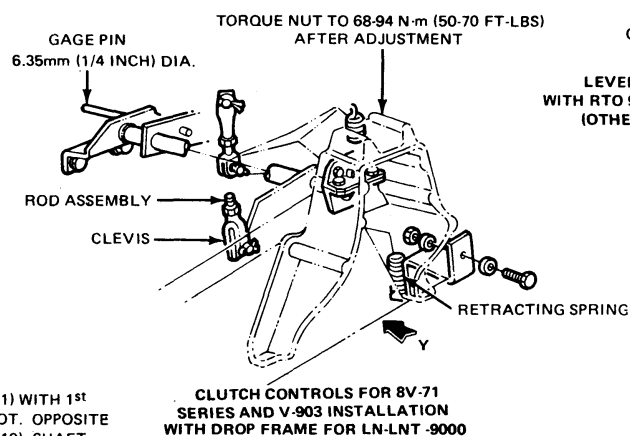
INSTALL (7523) RETRACTING SPRING.



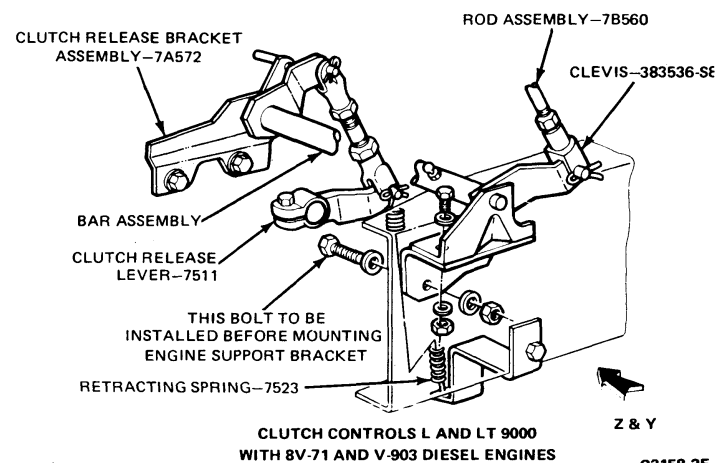
VIEW Y
LEVER AND CLUTCH SETTING
WITH RTO 910, 9513 AND RTF-1110-9509
(OTHERWISE SAME AS VIEW Z)



VIEW Z
LEVER AND CLUTCH SETTINGS
FOR ALL MODELS WITH RTO 910, RT910
T-905 A, RT AND RTO 9513, RTF-1110-9509 TRANSMISSIONS



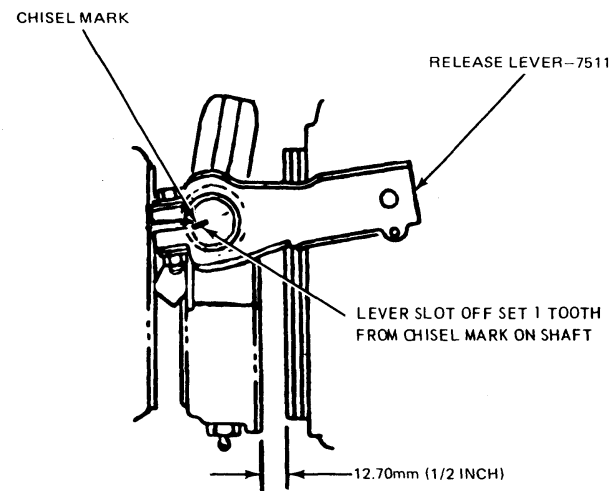
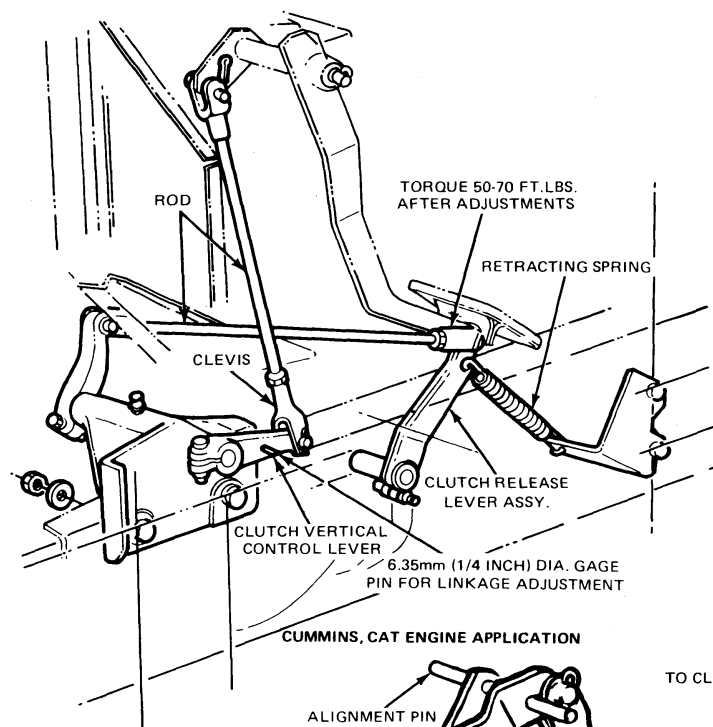
CLUTCH CONTROLS FOR 8V-71
SERIES AND V-903 INSTALLATION
WITH DROP FRAME FOR LN-LNT-9000



CLUTCH CONTROLS L AND LT 9000
WITH 8V-71 AND V-903 DIESEL ENGINES

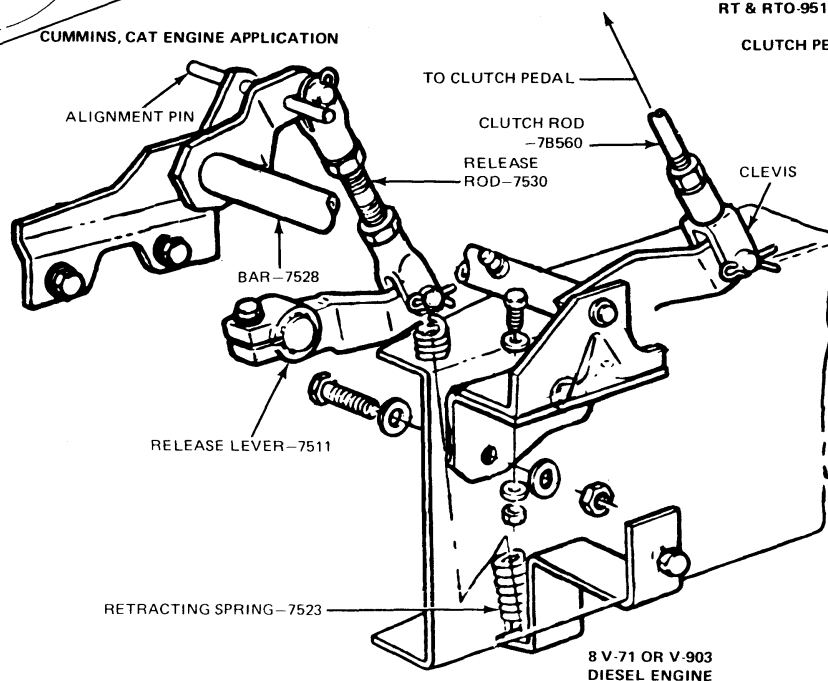
C3158-2E

FIG. 17 Clutch and Linkage—L-, LT-9000 with 8V-71



L-LT-9000 WITH FULLER T905-A&B, RT & RTO-910,
RT & RTO-9513 AND 8516 & 8716 AND SST-1010 TRANSMISSIONS

CLUTCH PEDAL FREE TRAVEL: 57.15 TO 63.50mm (2 1/4 - 2 1/2 INCH) FOR L-LT-9000 MODELS
54.10-63.50mm (2.13-2.50 INCH) FOR LN-LNT-9000 MODELS



CLUTCH LINKAGE ADJUSTMENT

1. DISCONNECT RETRACTING SPRING AND ADJUST PEDAL TOTAL TRAVEL.
2. INTERNALLY ADJUST CLUTCH TO CLEARANCE SHOWN.
3. DISCONNECT CLUTCH ROD 78560 AT EQUALIZER BAR 7528 AND INSTALL 6.35mm (1/4 INCH) DIA. ALIGNMENT PIN, AS SHOWN.
4. CHECK FOR ZERO RELEASE BEARING CLEARANCE. IF NOT, ADJUST RELEASE ROD 7530.
5. WITH PEDAL HELD AGAINST ITS STOP, ADJUST CLUTCH ROD 78560 UNTIL CLEVIS PIN FITS FREELY INTO EQUALIZER BAR 7528.
6. LENGTHEN CLUTCH ROD 78560 SIX TURNS, REMOVE ALIGNMENT PIN AND CONNECT CLUTCH ROD TO EQUALIZER BAR. TIGHTEN JAM NUTS.
7. CONNECT RETRACTING SPRING. PEDAL FREE TRAVEL SHOULD NOW BE TO SPECIFICATION.
8. WITH LINKAGE CORRECTLY SET, ALL PEDAL FREE PLAY ADJUSTMENTS MUST BE MADE BY INTERNALLY ADJUSTING THE CLUTCH.

FIG. 18 Clutch and Linkage—L-, LT-9000 with 8V-71, Cummins, Caterpillar 3406 Diesel Engines

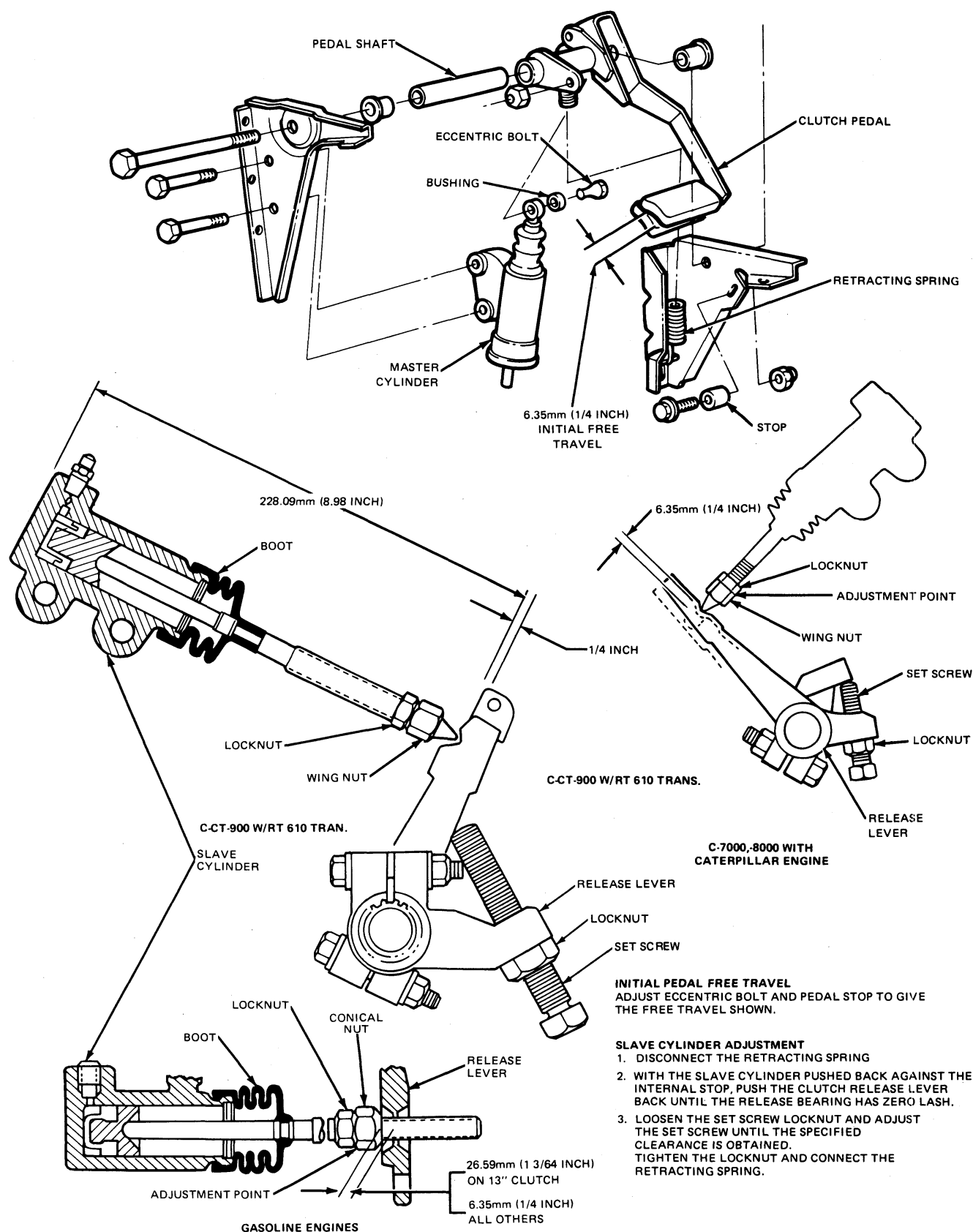


FIG. 19 Clutch Free Travel Adjustment—C-Series

BRONCO, E-100-E-350, F-100-F-250

Transmission Type and Make	Approx. Capacity		
	U.S. Pints	Imperial Pints	Liters
4-Speed — New Process 435 — (without extension) — Bronco F-100 — F-250	7.0	5.5	3.3
3-Speed (Ford) F-100 — F-250 E-100 — E-350	3.5	2.8	1.6
4-Speed (New Process 435) F-100 — F-250	7.0	5.5	3.3
4-Speed (Warner T-18-B) F-100-F-250, Bronco, F-150 (4x4)	7.0	5.5	3.3
4-Speed Overdrive — F-100 — F-250, E-100 — E-250	4.5	3.7	2.1
F-150 — F-250			
4-Wheel Drive Transfer Case Two Speed Part Time (New Process Gear)	4.0	3.2	1.9
Full Time (New Process Gear)	9.0	7.5	4.2

800-900 and 8000-9000 SERIES

Transmission Type and Make	Filler Location	Drain Location	Approx. Capacity		
			U.S. (Pints)	Imperial (Pints)	Liters
3-Speed H.D. Auxiliary (Spicer R8031-R)	Rt	L	12	10	5.6
(Spicer 7231-D)	Rt	L	8	6½	3.7
4-Speed Auxiliary (Spicer 7041)	Rt	L	11	9½	5.2
(Spicer R8341-C)	Rt	L	12	10	5.6
5-Speed (Spicer CM-5000)	L	L	17	14	8.0
5-Speed (Spicer CM-6000)	L	L	18	15	8.5
5-Speed Heavy-Duty (Clark 280, 282, 285)	Rt	Center Rear	8	6½	3.7
5-Speed Extra Heavy-Duty (Clark 390, 397)	Rt	Center Rear	8	6½	3.7
10-Speed Fuller (RT-12510, RTF, and RTOF-910)	L	B	25	21	11.8
10-Speed fuller (RT-610)	L	B	12	10	5.6
Automatic Transmission (MT-Series)	*Rt	Rt	35	29.1	16.6
5-Speed Fuller (T905-A & B)	L	B	22	18½	10.4
Fuller RT-12513, RT-, RTF-, RTO-, RTOF-9513	L	B	27	22½	12.7
6-Speed Fuller RT906	L	B	26	21½	12.3
SST-1007-3A	Main Unit		38	31¾	18.0
	Low Hole Gearbox		10	8¾	4.7
13-Speed Fuller RT613	L (2)	B	⊙	13½	7.5
9-Speed Fuller 9509	L	B	25	21	11.8
10-Speed Fuller 1110	L	B	25	21	11.8
RTO-958-LL	L	B	27	22½	12.7

*On a C-Series Truck, the dipstick should be removed through the opening in the panel behind the seat back cushion with the cab in its normal position.

⊙ 7 pts front case, 9 pts rear case.

Rt — Right L — Left B — Bottom

Transmission Refill Capacities**600-700 and 7000 SERIES**

Transmission Type and Make	Filler Location	Drain Location	Approx. Capacity (Pts.)		Liters
			U.S.	Imp.	
5-Speed (Spicer CM-5000-6000)	L	L	17	11	8.0
4-Speed (New Process) NP-435	L	L	6¾	5½	3.2
4-Speed Warner T-19	Rt	Rt	6½	5½	3.0
5-Speed NP-542	R	Rear	9	7½	4.2
5-Speed Heavy-Duty (Clark 280, 282, 285)	Rt	Center Rear	8	6½	3.7
5-Speed Extra Heavy-Duty (Clark 390, 397)	Rt	Center Rear	8	6½	3.7
10-Speed Fuller (RT-610)	L	B	12	10	5.6
Allison AT-540	Rt	Rt	27½	22.9	12.9
Allison MT-643	Rt	Rt	38	31.64	17.9

Rt — Right L — Left B — Bottom

[a] On a C-Series truck, the dipstick should be removed through the opening in the panel behind the seat back cushion with the cab in its normal position.

[b] If hubs have been removed, an additional 1/2 pint of axle lubricant must be added. Add lubricant through the axle vent.

MECHANICAL CLUTCH LINKAGE ADJUSTMENTS

Models	Pedal Height		Total Travel		Free Travel	
	MM	Inch	MM	Inch	MM	Inch
F-Series-700	192.08	7-9/16	200.02	7-7/8	38.1-41.27	1-1/2-1-5/8
Model 84 — Chassis and Cowl	282.57	11-1/8	219.86	8-21/32	38.1-41.27	1-1/2-1-5/8
L, LN, LT, LNT, LTS-800					57.15-63.50	2-1/4-2-1/2
LN-600-700					47.62-53.97	1-7/8-2-1/8
LN-7000, L, LN, LT, LNT, LTS-8000	330.59 ②	13-1/64 ②	265.90	10-15/32	52.78-58.73 ①	2-5/64-2-5/16 ①
L, LN, LT, LNT, LTS-900-, SAE Housing L, LN, LT, LNT, LTS-900 — Ford Housing					47.62-53.97	1-7/8-2-1/8
L, LN, LT, LNT, LTS-9000 w/NH Det. 671 N, Cat 3406					50.80-58.73 ①	2-2-5/16 ①
L, LT-9000 w/8V-71 Engine					57.15-63.50 ①	2-1/4-2-1/2 ①
LN, LNT-9000 Drop Frame w/8V-71 Engine					53.97-63.50 ①	2-1/8-2-1/2 ①

① Internally adjust clutch to maintain pedal free travel.

② Travel to firewall.

CC2159-2K

Models	Free Travel
E-100—E-350	19.05-38.10mm (¾-1½ inch)
F-100—F-350, Bronco	19.05-38.10mm (¾-1½ inch)

CC3611-1B

Automatic Transmission

PART 50-17

APPLIES TO ALL MODELS

SUBJECT	PAGE	SUBJECT	PAGE
LUBRICATION		MAINTENANCE (Cont'd.)	
Check Transmission Fluid Level		Adjust Neutral Start Switch	
AT-540 Transmission	50-17-2	E-100 — E-350, F-100 — F-350	
C-4 and C-6		and Bronco	50-17-2
Transmissions	50-17-1	Adjust Transmission	
MT-Series Transmission	50-17-2	Shift Lever	50-17-2
MAINTENANCE		Transmission Mountings	50-17-2
Adjust C-4 Transmission		PRE-DELIVERY	50-17-1
Bands	50-17-2	Transmission Cooler	
Adjust C-6 Transmission		Line Filter	50-17-1
Intermediate Band	50-17-3	SPECIFICATIONS	50-17-4
Low-Reverse Band	50-17-3		

PRE-DELIVERY

Refer to Part 50-02 for Automatic Transmission Pre-Delivery service procedures.

LUBRICATION

CHECK TRANSMISSION FLUID LEVEL

C-4 AND C-6 TRANSMISSIONS

These automatic transmissions are designed to operate with the oil level between the ADD and FULL mark on the dipstick at an operating temperature of 65°-76° C (150°-170° F). Fluid level should be checked under these temperatures. Obtain operating temperature by driving 25-32 km (15-20 miles) of city driving with the outside temperature above 10° C (50° F).

If the transmission is not checked at an operating temperature of 65°-76° C (150°-170° F) and it becomes necessary to check the fluid level, the fluid may be checked at room temperature 21°-35° C (75°-95° F). (Dipstick cool to touch.)

ROOM TEMPERATURE FLUID LEVEL CHECKING PROCEDURE

1. With the transmission in Park "P" position, engine at curb idle rpm, foot brakes applied and vehicle on level surface, move the transmission selector lever through each range, allowing time in each range to engage transmission. Return to Park "P" position and apply parking brake. Do not turn off the engine during the fluid level check.

2. On a vehicle equipped with a vacuum brake release, disconnect the vacuum release line and plug the end of the line. The parking brake will not remain applied when the transmission selector is moved out of the "P" Park position unless the vacuum brake release is disconnected.
3. Clean all dirt from the transmission fluid dipstick cap before removing the dipstick from the filler tube.
4. Pull the dipstick out of the tube, wipe it clean and push it all the way back into the tube. Be sure it is fully seated.
5. Pull the dipstick out of the filler tube again and check the fluid level. The level should be between the middle and top holes on the dipstick. If the fluid level is between the middle hole or above the top hole:

On C4 Transmissions: Add or remove fluid to bring level between the middle hole and "add" mark.

On C6 Transmissions: Add or remove fluid to bring level between the middle hole and top hole.

6. If it becomes necessary to add fluid to a transmission, be sure to use the correct fluid as specified on the TRN transmission dipstick.

7. Install the dipstick, making sure it is fully seated in the tube.
8. Unplug and connect the vacuum brake release line, on those vehicles so equipped.
9. If the transmission fluid level is correctly established at 21°-35° C (70°-95° F) it will appear between the "Add" and "Fill" mark on the dipstick when the transmission reaches an operating temperature of 65°-76° C (150°-170° F). **Do not over-fill or under-fill.** Overfill can cause the fluid to foam and spill out through the transmission vent with resultant transmission malfunction.

Underfill can result in transmission loss of engagement or slipping. This condition is most evident in cold weather or when the vehicle is parked or being driven on a hill.

If the transmission fluid level is checked when the fluid is cold, the dipstick could indicate that fluid should be added. If the fluid is added at this time, an overfill condition could result when the fluid reaches operating temperatures of 65°-76° C (150°-170° F). (Dipstick hot to touch). Note: If the vehicle has been operated under such conditions as hot weather operation in downtown traffic, extended periods of high speed driving or trailer towing, the fluid may have become hotter than 65°-76° C (150°-170° F). When this has happened, the fluid should be allowed to cool before attempting to check the fluid level.

MT-SERIES TRANSMISSION

With the truck standing level and parking brake applied, start the engine and move the transmission

shift lever through all the shift positions, allowing sufficient time in each range to engage the transmission. After engaging each transmission range, place selector lever in N (NEUTRAL) position. The engine should be running at idle speed and the engine and transmission at operating temperature. Do not turn off engine during fluid level check.

1. Clean all dirt from the transmission fluid dipstick cap before removing the dipstick from the filler tube.
2. Pull the dipstick out of the tube, wipe it clean, and push it back into the tube. Be sure it is fully seated.

NOTE: The dipstick has two (2) hot marks and two (2) cold marks between the ADD and FULL marks.

Hot Oil Check

Engine idling and transmission at normal operating temperature 71-93° C (160°-200° F). Pull the dipstick out and check fluid level. The level should be between the two HOT marks. If additional fluid is required, add enough fluid through the filler tube to bring the level between the ADD and FULL marks on the dipstick. Do not overfill the transmission, as foaming and loss of fluid through the vent may result in transmission malfunction.

Cold Oil Check

Engine idling and transmission at 16°-49° C (60°-120° F), cool to touch. Pull the dipstick out and check fluid level. The level should be between the bottom two COLD marks. If additional fluid is required, add oil to bring the level to the middle of the COLD marks. Replace dipstick in tube, making sure it is fully seated.

MAINTENANCE

ADJUST TRANSMISSION SHIFT LEVER

Be sure lever position indicates proper transmission range. Correct, if necessary.

TRANSMISSION COOLER LINE FILTER (EXCEPT C4 AND C6 TRANSMISSIONS)

Transmission damage may create debris which can be trapped in the transmission oil cooler. In most cases there is no effective method for completely removing this material from the transmission oil cooler, yet it must be prevented from entering a repaired or replaced transmission. By installing an external filter in the cooler to transmission return oil circuit, the debris remaining in the cooler will be filtered from the oil and provide protection against a possible repeat repair due to contamination.

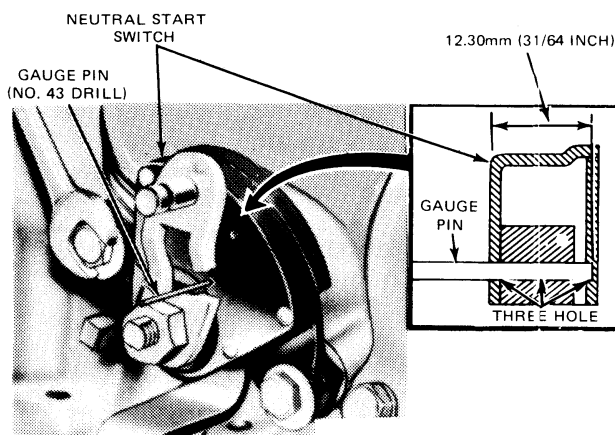
TRANSMISSION MOUNTINGS

Be sure transmission attaching bolts are tightened to specifications.

ALIGN BACKUP LAMP SWITCH

E-100—E-350, F-100—F-350, Bronco

1. With the manual linkage properly adjusted, loosen the two switch attaching bolts (Fig. 1).



D1459-1B

FIG. 1 Backup Lamp Switch—E-100—E-350, F-100—F-350, Bronco

2. Place the transmission manual lever in **NEUTRAL**. Rotate the switch and insert the gauge pin (No. 43 drill shank end) into the gauge pin holes of the switch. The gauge pin has to be inserted a full 31/64 inch into the three holes of the switch (Fig. 2).

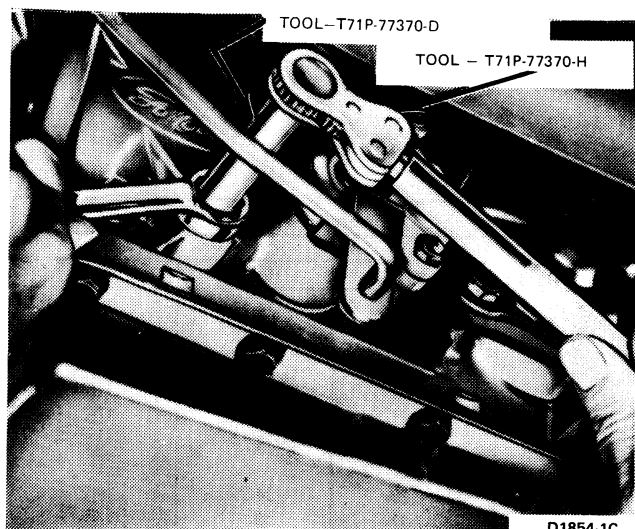


FIG. 2 Intermediate Band Adjustment—C4 Transmission

3. Tighten the two backup lamp switch attaching bolts to 6.5-8.0 N·m (55-75 in-lbs). Remove the gauge pin from the switch.
4. Check the operation of the switch. The backup lamps should operate only with the transmission selector lever in **Reverse**.

ADJUST C-4 TRANSMISSION BANDS

Using the tools indicated, tighten the adjusting screw until the tool handle clicks. The tool is a pre-set torque wrench which clicks and breaks when the torque on the adjusting screw reaches 13 N·m (10 ft-lbs).

INTERMEDIATE BAND

1. Clean all dirt from the band adjusting screw and apply penetrating oil to the adjusting screw threads. Remove and discard the locknut.
2. Install a new locknut on the adjusting screw. With the tool shown in Fig. 2, tighten the adjusting screw until the tool handle clicks.
3. Back off the adjusting screw **exactly 1-3/4 turns**.
4. Hold the adjusting screw from turning and tighten the locknut to specification listed at the end of this Part.

LOW-REVERSE BAND

1. Clean all the dirt from the band adjusting screw area and apply penetrating oil to the adjusting screw threads. Remove and discard the locknut.
2. Install a new locknut on the adjusting screw. With the tools shown in Fig. 3, tighten the adjusting screw.
3. Back off the adjusting screw **exactly 3 full turns**.
4. Hold the adjusting screw from turning and tighten the locknut to specification listed at the end of this Part.



FIG. 3 Low-Reverse Band Adjustment—C4 Transmission

ADJUST C-6 TRANSMISSION INTERMEDIATE BAND

1. Clean all the dirt from the band adjusting screw area. Remove and discard the locknut.
2. Install a new locknut and tighten the adjusting screw to 13 N·m (10 ft-lbs) torque (Fig. 4).
3. Back off the adjusting screw exactly 1-1/2 turns.
4. Keep the adjusting screw from turning and tighten the locknut to specification list at the end of this Part.

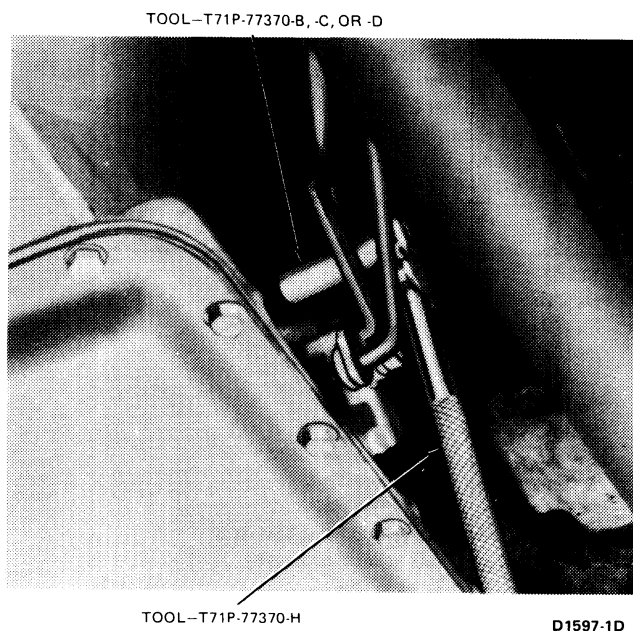


FIG. 4 Intermediate Band Adjustment—C6 Transmission

SPECIFICATIONS

Refer to Group 17 for any specifications or Special Tools not contained in this Section.

TORQUE LIMITS — C4 AND C6 TRANSMISSIONS

Item	Torque Limit			
	C4		C6	
	(ft-lbs)	N•m	(ft-lbs)	N•m
Overrunning Clutch Race to Case	13-20	18-27	18-25	25-33
Oil Pan to Case	12-16	17-21	12-16	17-21
Diaphragm Retainer Clip to Case			12-16	17-21
Stator Support to Pump	12-20	17-27	12-16	17-21
Converter Housing Cover to Converter Housing	12-16	17-21	12-16	17-21
Guide Plate to Case — Parking Rod			12-16	17-21
Rear Servo Cover to Case	12-20	17-27		
Intermediate Servo Cover to Case	16-22	22-29	14-20	19-27
Oil Distributor Sleeve to Case	12-20	17-27	12-16	17-21
Front Pump to Case	28-38	38-51	16-30	22-40
Extension to Case	28-40	38-54	25-35	34-47
Front Pump and Converter Housing to Case	28-38	38-51		
Converter Housing to Case	28-40	38-54		
Extension Housing to Bearing Retainer Stud			35-50	48-67
Engine Rear Cover Plate to Converter Housing			20-30	28-40
Transmission to Engine	40-50	55-67	40-50	55-67
Engine Separator Plate to Converter Housing	5-9	7-12		
Engine to Converter Housing	28-38	38-51		
Downshift Lever to Shaft	12-16	17-21	12-16	17-21
Engine to Transmission (PEJ)	23-33	32-44		
Flywheel to Converter	20-30	28-40	20-30	28-40
Bearing Retainer to Extension Housing			35-45	48-61
Band Adjusting Screws to Case	35-45	48-61		
Intermediate Band Adjusting Screw to Case			35-45	48-61
Manual Valve Inner Lever to Shaft	30-40	41-54	30-40	41-54
Yoke to Output Shaft (F-150, 250 4x4)			100-150	136-203
Plug — Case TRS Switch Port	6-12	9-16	6-12	9-16
Plug — Case Front Pump or Line Pressure	6-12	9-16	6-12	9-16
Plug — Case Throttle Pressure			6-12	9-16
Plug — Converter Drain	15-28	21-37	14-28	19-37
5/16" Fitting — Cooler Line Connector to Case — Front & Rear (Case Fitting)	12-18	17-24	10-16	14-21
3/8" Fitting — Cooler Line to Transmission Case — Front & Rear			20-35 (2)	28-47 (2)
5/16" Tube Nut — Cooler Line to Transmission Cast Fitting	12-18@	17-24@	12-18@	17-24@
FillerTube to Oil Pan	32-42	44-56		
	(in-lbs)	N•m	(in-lbs)	N•m
End Plates to Body	25-40	2.9-4.5	20-40	2.3-4.5
Separator Plate to Lower Body	40-55	4.6-6.2		
Reinforcement Plate to Lower Body			20-45	2.3-5.0
Inner Downshift Lever Stop			20-45	2.3-5.0
Lower to Upper Body	40-60	4.6-6.7	40-55	4.6-6.2
Upper to Lower Body	80-120	9.1-13.5	40-55	4.6-6.2
Shift Valve Plate to Upper Body			20-45	2.3-5.0
Reinforcing Right Side Plate to Lower Body			20-45	2.3-5.0
Screen and Lower Body to Upper Body			40-55	4.6-6.2
Screen to Upper Body	40-60	4.6-6.7		
Screen and Lower Valve Body to Upper Valve Body			40-55	4.6-6.2
Converter Housing Cover to Converter Housing			30-60	3.4-6.7
Belt Positive Detent Spring to Case			80-120	9.1-13.5
Governor to Oil Collector	80-120	9.1-13.5	80-120	9.1-13.5
Pump Assembly to Case	20-35	2.3-3.9		
Main Control to Case	80-120	9.1-13.5	95-125	10.8-14.1
Neutral Switch to Case	55-75	6.3-8.4	55-75	6.3-8.4
5/16" Fitting — Cooling Line to Transmission Case	80-120	9.1-13.5	60-120	6.8-13.5

AUTOMATIC TRANSMISSION REFILL CAPACITY

Vehicle	Transmission Type	Engine	Approximate Refill Capacity*		
			U.S. Quarts	Imperial Quarts	Liters
E100-E350	C6	4.9L (300 CID) I-6 5.0L (302 CID) V-8 5.8L (351 CID) V-8	11-3/4	9-3/4	11.1
F100-F350 (4 x 2)	C6	4.9L (300 CID) I-6 5.0L (302 CID) V-8 5.8L (351 CID) V-8 6.6L (400 CID) V-8	11-3/4	9-3/4	11.1
F100-F350 (4 x 2)	C4	4.9L (300 CID) F-6 5.0L (302 CID) V-8	10	8-1/4	9.4
F100-F350 (4 x 4)	C6	5.0L (302 CID) V-8 5.8L (351 CID) V-8 6.6L (400 CID) V-8	13-1/2	11-1/4	12.8
Bronco (4 x 4)	C6	5.0L (302 CID) V-8 5.8L (351 CID) V-8	13-1/2	11-1/4	12.8

*Approximate dry capacity, includes cooler and lines. Fluid level indicator should be used to determine **actual** fluid requirements and fluid specifications. Check level at normal operating temperature. **DO NOT OVERFILL.**

If it is necessary to add or replace fluids, use only fluids which have been certified by the supplier as meeting one of the Ford Motor Company specifications shown below:

C4 and C6 transmissions — Use fluids meeting specification ESP-M2C138-CJ, or Dextron II, Series D or equivalent.

CD2928-2A

Gasoline Engines

PART 50-21

APPLIES TO ALL MODELS

SUBJECT	PAGE	SUBJECT	PAGE
LUBRICATION		MAINTENANCE (Cont'd.)	
Check Engine Oil Level	50-21-3	Check Engine Mountings	50-21-5
General	50-21-3	Clean Crankcase Emission System and Replace Valve	50-21-4
Oil Filter	50-21-3	Clean Crankcase Fill Cap Breather — Super Duty Engines	50-21-3
Oil Viscosity	50-21-3	Clean Engine Oil Cooler — Super Duty 7.8L (475 CID) V-8 7.8 (477 CID) V-8 and 8.8L (534 CID) V-8 Engines ..	50-21-4
MAINTENANCE		Compensating Governor	50-21-6
Adjust Vacuum Governor	50-21-5	Constant Altitude Adjustment	50-21-6
Adjust Velocity Governor Conventional and Coolant Heated Velocity Governors	50-21-5	Varying Altitude Adjustment	50-21-6
Check and Adjust Drive Belt Tensions	50-21-4	Mechanical Governor Adjustment	50-21-6
Air Compressor Belt	50-21-5	Oil Viscosity vs. Temperature Recommendations	50-21-7
Alternator and Water Pump Belts	50-21-5	Replace Crankcase Ventilation Filter	50-21-4
Power Steering Pump Belt	50-21-5	Torque Intake Manifold Bolts 6- and 8-Cylinder	50-21-3
Separate Fan Belt	50-21-5	PRE-DELIVERY	50-21-1
100-350 Series Trucks	50-21-5	SPECIFICATIONS	50-21-8
600-900 Series Trucks	50-21-5		
Single or Double Fan Belts	50-21-5		
Check and Adjust Valve Lash 7.8L (475 CID) V-8 7.8L (477 CID) V-8 and 8.8L (534 CID) V-8	50-21-4		

PRE-DELIVERY

Refer to Part 50-02 for Gasoline Engine Pre-delivery procedures.

LUBRICATION

GENERAL

By law, vehicles are equipped with air pollution control systems. To maintain these systems, use of a high grade motor oil is essential. Ford Motor Oil or equivalent oils are formulated to meet these requirements. Other brands, if used, must meet Ford performance specification ESE-M2C153-A (API Classification SE). Improved engine oils labeled "API Classified SF" (ESE-M2C153-B or equivalent) are expected to be introduced during the 1980 model year. Oils labeled API, SF or in combination i.e. SF SE, SF

CC, SF CD are preferred as they offer improved wear protection. These improved oils should be used as soon as they are available.

These oils contain an additive which neutralizes the corrosive acids (generated in all engines by burning gasoline) which are not completely removed by the exhaust emission control system. In addition, the specified oils keep the crankcase ventilation valve clean, so that the emission control system will operate as designed.

Refer to Part 50-29, Engine Emission Control Systems, for engine oil and oil filter change procedures.

OIL VISCOSITY

From the tables in the Specifications Section, select the viscosity that most nearly matches the expected temperature range of vehicle operation.

OIL FILTER

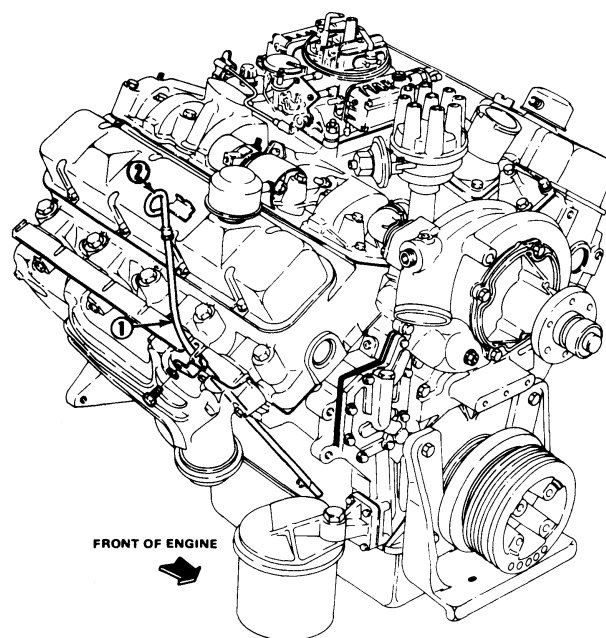
Proper oil filtration is as essential as good motor oil. The two-stage filtering action of a Motorcraft oil filter has been shown by tests to be more effective than ordinary filters. Use Motorcraft oil filters or one which meets the Ford specifications (Part 50-03 Lubrication Charts and Lubricant Specifications).

CHECK ENGINE OIL LEVEL

Use the dipstick to check the oil level; it should be between the ADD and FULL marks on the dipstick or within the SAFE area on the dipstick (if so equipped).

Add oil of specified quality only. See Part 50-03, Lubrication Charts and Lubricant Specifications.

On 7.8L (477 CID) V-8 and 8.7L (534 CID) V-8 engines, the oil level dipstick must be installed with the dipstick handle facing away from the engine (Fig. 1) or erroneous readings may result.



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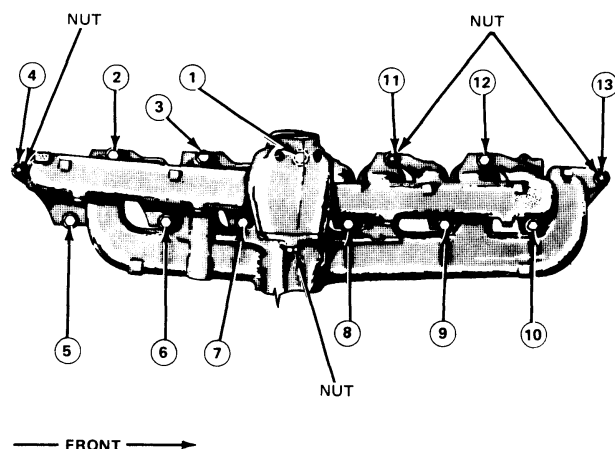
FIG. 1 Oil Level Dipstick—7.8L (475 CID) V-8, 7.8L (477 CID) V-8 and 8.8L (534 CID) V-8 Engines

MAINTENANCE

TORQUE INTAKE MANIFOLD BOLTS

6- AND 8-CYLINDER

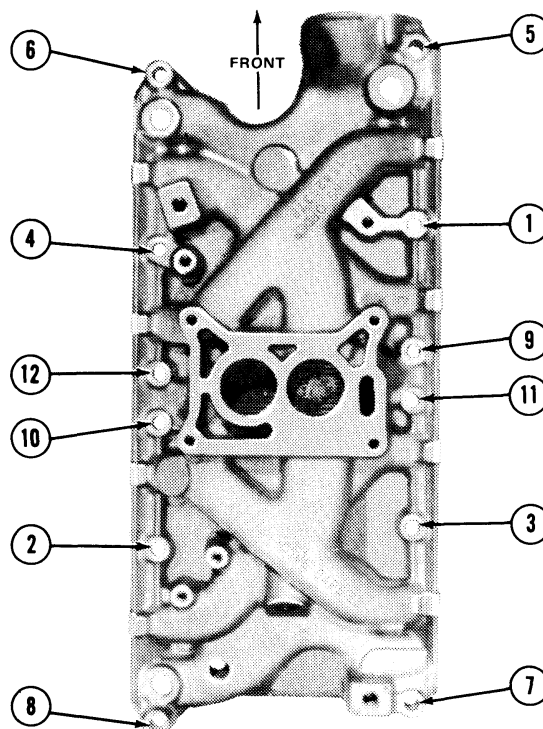
Refer to Figures 2 through 6 for the correct tightening sequence. Tighten the manifold to specifications found at the end of this part.



A3186-1C

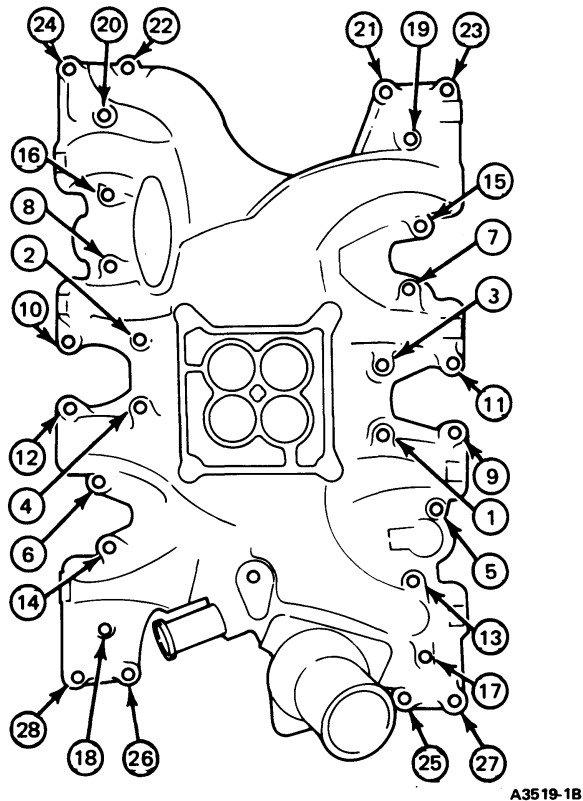
FIG. 2 Intake and Exhaust Manifolds Torque Sequence

Tighten bolts evenly, crisscrossing the manifold as per illustrations.



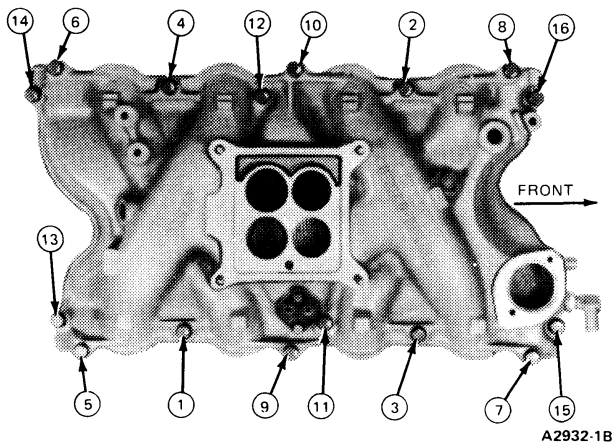
A1658-1G

FIG. 3 Intake Manifold Torque Sequence—4.9L (302 CID) V-8 and 5.8L (351 CID) W-V-8 Engines



A3519-1B

FIG. 4 Intake Manifold Torque Sequence—7.8L (477 CID) V-8, and 8.8L (534 CID) V-8 Super Duty Engines



A2932-1B

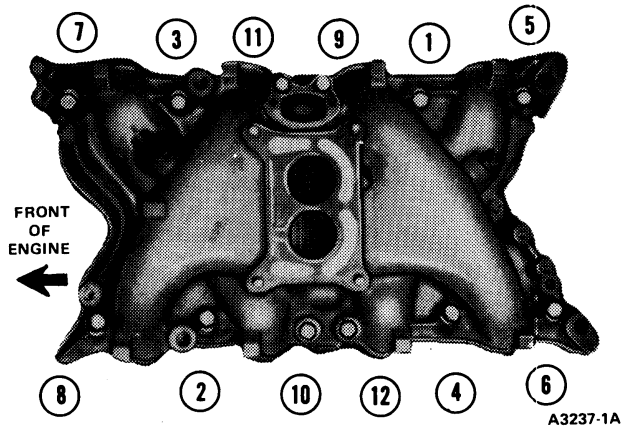
FIG. 5 Intake Manifold Torque Sequence—6.1L (370 CID), 7.0L (429 CID) and 7.5L (460 CID) V-8 Engines

CHECK AND ADJUST ENGINE GOVERNOR SPEED

Refer to the Maintenance Section of this Part for the governor speed adjustment procedures.

CHECK ENGINE PERFORMANCE

Engine operation should be smooth and consistent with weight, engine size and transmission/axle ratio combination.



A3237-1A

FIG. 6 Intake Manifold Torque Sequence—5.8L (351 CID)-M-V-8 and 6.6L (400 CID) V-8 Engines

CLEAN CRANKCASE FILL CAP BREATHER—SUPER DUTY ENGINES

Clean the breather cap assembly at specified maintenance intervals (Part 50-29, Engine Emission Control Systems). With a closed type crankcase ventilation system, the air hoses will have to be disconnected before removing the filler cap assemblies.

REPLACE CRANKCASE VENTILATION FILTER

Refer to Part 50-29, Engine Emission Control Systems, for recommended maintenance interval and procedure.

CLEAN ENGINE OIL COOLER—SUPER DUTY 7.8L (477 CID) V-8 AND 8.8L (534 CID) V-8 ENGINES

Removal

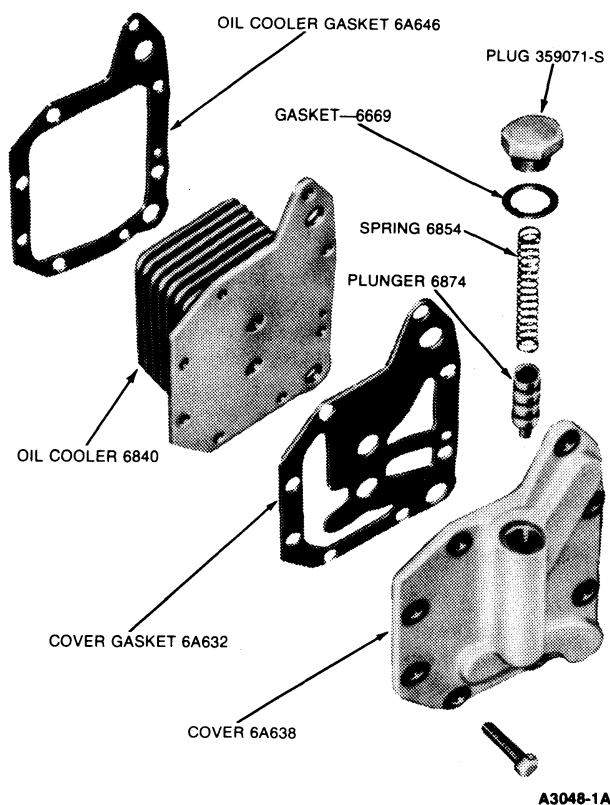
1. Drain the cooling system.
2. Remove the oil cooler cover and gasket and the oil cooler and gasket.
3. Remove the relief valve plug and gasket; then remove the spring and plunger. The oil cooler assembly is shown in Fig. 7.

Cleaning

Clean the oil cooler as soon as possible after removing it from the engine, or soak it in cleaning solvent until ready to clean. This will prevent hardening and drying of accumulated foreign material.

Immerse the oil cooler in a commercial cleaning solvent and clean the outside of the plates with a stiff bristle brush.

Pressure circulate a standard commercial solvent (at a pressure of approximately 20 psi) through the oil passages of the cooler from the bottom hole (inlet) to the top hole (outlet). If a circulating pump is not available, soak the cooler in solvent for a few minutes and force the solvent through the oil passages with a plunger or piston-type hand pump. If the oil passages are severely clogged, use an alkaline solution. After cleaning, pressure flush the cooler with clean hot water.

**FIG. 7 Oil Cooler Assembly**

Thoroughly clean the passages in the cover and clean the relief valve assembly. Remove gasket sealer from the cover, oil cooler, and block.

Installation

1. Install the relief valve plunger (with the open chamber up), spring, gasket and plug in the cover.
2. Place a new cooler gasket, with sealer on both sides, on the block. Position the oil cooler in the block.
3. Place a new cover gasket on the cover with sealer on both sides and install the cover, then tighten the cover bolts to specifications (refer to Specifications in the appropriate Engine Part).
4. Fill the cooling system.

CLEAN CRANKCASE EMISSION SYSTEM AND REPLACE VALVE

Do not attempt to clean the crankcase ventilation system (PCV) valve. It must be replaced at the scheduled maintenance interval.

Refer to Part 50-29, Engine Emission Control Systems, for the recommended maintenance procedure.

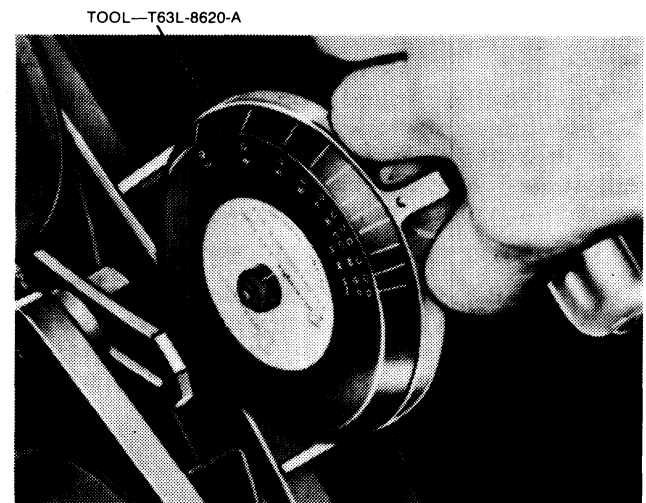
CHECK AND ADJUST VALVE LASH 7.8L (475 CID) V-8, 7.8L (477 CID) V-8 AND 8.8L (534 CID) V-8

The valve lash must be held to the correct specifications. If the lash is set too close, the valve opens too early and closes too late, resulting in rough engine idle. Burning and warping of the valves also occurs because valves cannot make contact with seats long enough to cool properly.

Refer to Part 50-29, Engine Emission Control Systems, for the recommended maintenance procedure.

CHECK AND ADJUST DRIVE BELT TENSIONS

Check noise level and belt tension, and correct as necessary (Fig. 8).



Q1002-1A

FIG. 8 Checking Drive Belt Tension

Refer to Part 50-29, Engine Emission Control Systems, for the recommended maintenance procedure.

Refer to the specifications at the end of this part for gasoline engine belt tension specifications.

100-350 SERIES TRUCKS

1. Install the belt tension tool on the drive belt(s) (Fig. 9) and check the tension, following the instructions of the tool manufacturer.
2. If adjustment is necessary, loosen the alternator mounting bolts and move the alternator adjusting arm bolt. Move the alternator toward or away from the engine until the correct tension is obtained. Remove the gauge. Tighten the alternator adjusting arm bolt and the mounting bolts. Install the tension gauge and check the belt tension.

600-900 SERIES TRUCKS

1. Install the belt tension tool on the drive belt(s) (Fig. 9) and check the tension, following the instructions of the tool manufacturer.

The tension is checked between the water pump pulley and the alternator pulley on single or double fan drive belts, and all alternator and water pump fan drive belts. The tension on separate fan drive belts is checked between the fan pulley and the crankshaft pulley. The tension of the air compressor drive belt is checked between the compressor pulley and the fan pulley or the crankshaft pulley (C-Series).

2. If adjustment is necessary, follow the applicable procedure.

SINGLE OR DOUBLE FAN BELTS

Loosen the alternator mounting bolts and the alternator adjusting bracket bolt. Move the alternator

toward or away from the engine until the correct belt tension is obtained. Tighten the alternator mounting bolts and the adjusting bracket bolt before checking the tension.

SEPARATE FAN BELT

Loosen the fan bracket mounting bolts. Slide the bracket up or down until the correct belt tension is obtained. Tighten the bracket bolts before checking the tension.

On a truck equipped with an air compressor, it may be necessary to loosen the compressor drive belt in order to obtain proper fan drive belt adjustment. Adjust the compressor drive belt after the fan drive belt adjustment is complete.

ALTERNATOR AND WATER PUMP BELTS

Loosen the alternator mounting bolts and the adjusting bracket bolt. Move the alternator toward or away from the engine until the proper tension is obtained between the water pump pulley and the alternator pulley. Tighten the alternator adjusting bracket bolt and the mounting bolts.

POWER STEERING PUMP BELT

Pump drive belt tension should not be checked using the thumb pressure or belt deflection methods. Correct belt adjustment is assured only with the use of a belt tension gauge.

1. Check the belt tension with a belt tension gauge, Tool T63L-8620-A or equivalent. Refer to the specifications section for drive belt tension specifications.
2. Loosen the pump attaching bolts, and pivot the pump or adjust slider stud nut to loosen or tighten

the belt tension as necessary. **Do not pry on the reservoir.**

3. Tighten the belt adjusting bolt to 41-47 N·m (30-35 ft-lbs). Check the tightness of the other mounting bolt (28-33 N·m or 20-25 ft-lbs torque).
4. When all bolts have been properly tightened, make a final check of the pump belt tension.

AIR COMPRESSOR BELT

Loosen the air compressor mounting bolts. Slide the compressor in its mounting bracket to obtain the recommended tension between the compressor pulley and the fan pulley (crankshaft damper on a C-Series truck). Tighten the compressor mounting bolts before checking the deflection. **The air compressor belt should be adjusted whenever the fan belt is adjusted or replaced. Adjust the air compressor belt last.**

CHECK ENGINE MOUNTINGS

Occasionally, the engine mountings should be visually checked. If the vehicle is operated on rough terrain, this check should be made frequently. If the mounting bolts are loose, tighten them to specifications (Specifications Section). If the insulators are cracked or frayed, replace them.

OIL VISCOSITY VS. TEMPERATURE RECOMMENDATIONS

When you change or add oil, select oil with the specifications and viscosity which most closely matches the temperature range you expect to encounter for the next oil change interval shown in Part 50-29, Engine Emission Control Systems.

SPECIFICATIONS

DRIVE BELT TENSION

Belt Size	Newly Installed [Ⓐ]	Used less than 10 min.	Used over 10 min.
All except ¼"	534-711N (120-160 lbs)	400-711N (90-160 lbs) [Ⓓ]	334-533N (75-120 lbs) [Ⓓ]
¼" Only	223-355N (50-80 lbs)	178-355N (40-80 lbs) [Ⓒ]	178-266N (40-60 lbs) [Ⓒ]

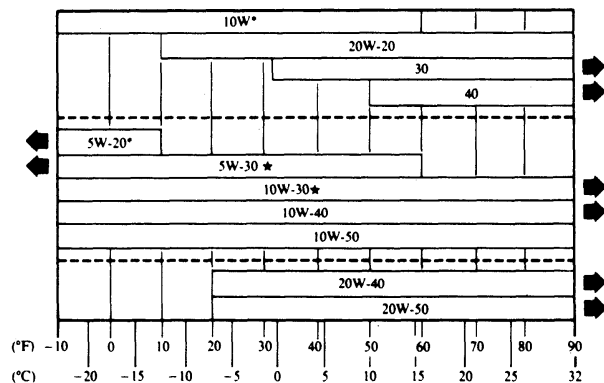
[Ⓐ] Tension measured immediately after belt is installed and before it is stretched or seats in pulley grooves.

[Ⓓ] If less than 90 lbs., readjust to 90-120 lbs.

[Ⓒ] If less than 40 lbs., readjust to 40-60 lbs.

[Ⓓ] If less than 75 lbs., readjust to 90-120 lbs.

CY1523-2C

OIL VISCOSITY RECOMMENDATIONS
ALL LIGHT TRUCK ENGINES

* Not recommended for sustained high speed driving.

★ Recommended for improved low temperature starting where temperatures are consistently below -10°F (-23°C).

CY2004-1B

INTAKE MANIFOLD BOLT TORQUE

Engine	(ft-lbs)	N•m
4.9L (300 CID) I-6	22-32	30-43
5.0L (302 CID) V-8	23-25	32-33
5.8L (351 CID) M-V-8	23-25	32-33
5.8L (351 CID) W-V-8	23-25	32-33
6.1L (370 CID) V-8	22-32	30-43
6.6L (400 CID) V-8 3/8"	22-32	30-43
5/16"	19-25	26-33
7.0L (429 CID) V-8	22-32	30-43
7.5L (460 CID) V-8	22-32	30-43
7.8L (477 CID) V-8	25-32	34-43
8.8L (534 CID) V-8	25-32	34-43

Torque bolts in sequence as shown in this Part.

CY2005-1B

CRANKCASE CAPACITIES — GASOLINE ENGINES

ENGINE	APPROXIMATE, CRANKCASE CAPACITY					
	WITH FILTER CHANGES			WITHOUT FILTER CHANGES		
	U.S. QUARTS	IMPERIAL QUARTS	LITERS	U.S. QUARTS	IMPERIAL QUARTS	LITERS
4.9 L (300 CID)	6	5	5.6	5	4.2	4.7
5.0L (302 CID)	6	5	5.6	5	4.2	4.7
5.8L (351 CID)-W	6	5	5.6	5	4.2	4.7
5.8L (351 CID)-M	6	5	5.6	5	4.2	4.7
6.1L (370 CID)	9	7.5	8.5	8	6.7	7.6
6.6L (400 CID)	6	5	5.6	5	4.2	4.7
7.0L (429 CID)	9	7.5	8.5	8	6.7	7.6
7.5L (460 CID)	6	5	5.6	5	4.2	4.7
7.8L (477 CID)	10	8.3	9.5	9	7.5	8.5
8.8L (534 CID)	10	8.3	9.5	9	7.5	8.5

CY1396-2K

CRANKCASE CAPACITIES — DIESEL ENGINES

Engine	Appropriate Crankcase Capacity		
	U.S. Quarts	Imperial Quarts	Liters
Ford 10.4L Caterpillar 3208 (175 H.P., 200 H.P., and 210 H.P.)	10 ① ②	8.3	9.5
Detroit 7.0L (6-71N)	18 ① ③	15	17
Detroit 9.3L (8V-71N)	23 ① ③	19	21.7
Detroit 9.3L (8V-71T), 9.3L (8V-71T), 9.3L (8V-71TTAE)	23 ① ③	19	21.7
Cummins NTC-230-250, NTC-290, Formula 250, 290, 350	28 ③	23.5	26.4
Cummins NTC-350	28 ③	23.5	26.4
Caterpillar 3406	30 ③	25	28.3

① Add 2 U.S. Quarts (or equivalent in Imperial Quarts or Liters with Full-Flow Filter.)

② Add 6 U.S. Quarts (or equivalent in Imperial Quarts or Liters with By-Pass Filter.)

③ Add 13 U.S. Quarts (or equivalent in Imperial Quarts or Liters with By-Pass Filter.)

CY2127-2A

Diesel Engines

PART
50-22

APPLIES TO ALL MODELS

SUBJECT	PAGE	SUBJECT	PAGE
CATERPILLAR V-8 DIESEL ENGINES		CUMMINS DIESEL ENGINES	
Lubrication		Lubrication and Maintenance	
Accelerator Linkage	50-22-1	Accelerator Linkage	50-22-3
Electric Starting Motor	50-22-1	Change By-Pass Oil	
Engine Oil and Filters	50-22-2	Filter Element	50-22-3
Engine Oil Level	50-22-1	Check Inlet Air Restriction	50-22-4
Maintenance		Clean Cooling System	50-22-4
Adjust Drive Belt Tension	50-22-2	Drain and Fill Cooling System	50-22-4
Check Air Inlet Piping	50-22-2	DETROIT DIESEL ENGINES	
Check Engine High and		Lubrication	
Low Idle Speed	50-22-2	Accelerator Linkage	50-22-5
Check Engine Mounting		Change Engine Oil	50-22-5
Bolts Torque	50-22-2	Engine Oil Level	50-22-5
Checking Adjustment of the		Starter Motor	50-22-5
Valve Lash	50-22-2	Maintenance	50-22-5
Check Inlet Air		Check Cooling System Hoses	50-22-6
Restriction	50-22-3	Clean Cooling System	50-22-6
Check Radiator Coolant Level	50-22-2	Drain and Fill Cooling System	50-22-6
Clean Cooling System	50-22-2	Water Filter and Conditioner	50-22-6
Clean or Replace Air			
Cleaner Element	50-22-2		
Drain and Fill Cooling System	50-22-2		
Priming the Fuel System	50-22-3		
Record Oil Pressure	50-22-2		

CATERPILLAR V-8 DIESEL ENGINES

NOTE: For specific lubrication and maintenance information refer to the owners manual or the engine manufacturers shop manual.

LUBRICATION

ACCELERATOR LINKAGE

Lubricate the friction points of the accelerator linkage with the specified lubricant (Part 50-03, Lubrication Charts and Lubricant Specifications) at the recommended mileage interval (Part 50-02, Pre-Delivery and Maintenance Schedules).

ELECTRIC STARTING MOTOR

Add a few drops of clean SAE 30 weight lubricating oil to cranking motor bearings. Remove front, center rear plugs and apply oil to wick. Replace plugs.

ENGINE OIL LEVEL

Check crankcase oil level before starting and when refueling. Always check oil level with engine stopped. The dipstick has two marks, and the distance between them represents 2.83 litres (3 quarts). Keep oil level above the ADD mark on the dipstick (Fig. 1).

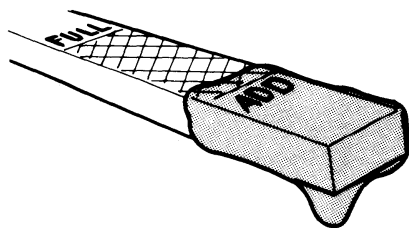
ENGINE OIL AND FILTERS

Refer to Diesel Operator's Manual.

MAINTENANCE

CHECK ENGINE MOUNTING BOLTS TORQUE

Use a ft-lb torque wrench and check the torque effort against the specifications for this engine. Refer to the



Y1710-1A

FIG. 1 Check Crankcase Oil

appropriate engine part in Volume 2 of the 1980 Truck Shop Manual for procedures and specifications.

CHECK AIR INLET PIPING

Check piping from air cleaner to intake manifold for loose clamps or connections; cracks, punctures or tears in hose or tubing; collapsing hose; or other damage.

Tighten clamps or replace parts, as necessary, to make air intake system air tight and be sure all air goes through air cleaner.

CHECK ENGINE HIGH AND LOW IDLE SPEED

Refer to Diesel Operator's Manual.

CHECKING ADJUSTMENT OF THE VALVE LASH

Refer to Diesel Operator's Manual.

RECORD OIL PRESSURE

Start the engine and operate at 800 to 1000 rpm until the oil temperature gauge reads 60°C (140°F). Reduce engine speed to idle and record the oil pressure. A comparison of pressure at idling speed with previous readings will give an indication of progressive wear of lubricating oil pump, bearings, shafts, etc. These readings are more accurate when taken immediately after an oil change.

ADJUST DRIVE BELT TENSION

Refer to Part 50-21, Gasoline Engines, for instructions on adjusting belts for alternator, water pump and air compressor.

CHECK RADIATOR COOLANT LEVEL

The coolant level should be maintained at approximately one inch below the filler neck of the radiator.

On L-Series with crossflow radiators, fill until the coolant is one inch from the top of the tank (engine cold).

CAUTION — DO NOT OPERATE ENGINE IF COOLANT LEVEL IS BELOW SIGHT GLASS.

Coolant water should be free from scale-forming minerals. Add rust inhibitor, if necessary. During freezing weather, add sufficient ethylene glycol base anti-freeze to the coolant to prevent freeze-up. **Do not add rust inhibitor to an anti-freeze containing its own rust inhibitor.**

CLEAN COOLING SYSTEM

Before cleaning this cooling system, refer to the appropriate Caterpillar Shop Manual for instructions and precautions.

To drain the system: Open radiator drain cock. Remove plugs from the engine block. Remove plug from the thermostat housing. Remove plug from the oil cooler (Fig. 2).

DRAIN AND FILL COOLING SYSTEM

To drain the radiator, open the drain petcock at the bottom of the radiator and drain the coolant into a container to prevent loss of anti-freeze. The radiator will drain faster if the filler cap is removed.

To drain the cylinder block, open the drain cocks at the thermostat housing and oil cooler, and remove the drain plugs from the rear of the cylinder block (one on each side) (Fig. 2).

To fill the cooling system, install the cylinder block plug and close the drain cocks at the radiator, thermostat housing and oil cooler. Pour the coolant into the radiator. Operate the engine until operating temperature is reached and check the coolant level.

CLEAN OR REPLACE AIR CLEANER ELEMENT

1. Loosen latches or wing nuts and remove cover and element assembly from the housing. Do not bump element against the housing.
2. Remove element from cover by loosening wingscrew on the end opposite the cover. Do not handle element with greasy hands.
3. Carefully inspect cover, sealing surfaces and gaskets for dents or possible air leaks. Always replace the sealing gasket when replacing the element. Replace the seal on the element if cracked or torn. Examine the element itself for holes or tears.
4. Filter elements must be cleaned by compressed air, or by air and washing. To clean with air, direct dry, clean air up and down the pleats inside the element. Air pressure must not exceed 689.5 kPa (100 psi). Hold the air nozzle a reasonable distance from element. If the element is still dirty, wash it following Steps 5-10.
5. Pour enough lukewarm water into a container large enough to completely submerge the element. Add four tablespoons of detergent made especially for washing air cleaners.
6. Place the element in the solution and let it soak for five minutes. Agitate in the solution for two more minutes.
7. Discard dirty solution, place the element in a new batch of cleaning solution and agitate for five minutes.
8. Remove element from the solution, drain and flush with clean water from outside inward. Use a gentle water stream and do not point directly at element. Allow to drain and dry completely.
9. Inspect the element for damage by suspending a low wattage light inside the element and rotating the element. If any breaks or fractures are seen, discard the element.
10. Wipe out any dirt in the filter housing and then install the filter element. Make sure that the gasket is in place on the top of the element and the nylon washer is in place under the wingscrew. Tighten the wingscrew securely.

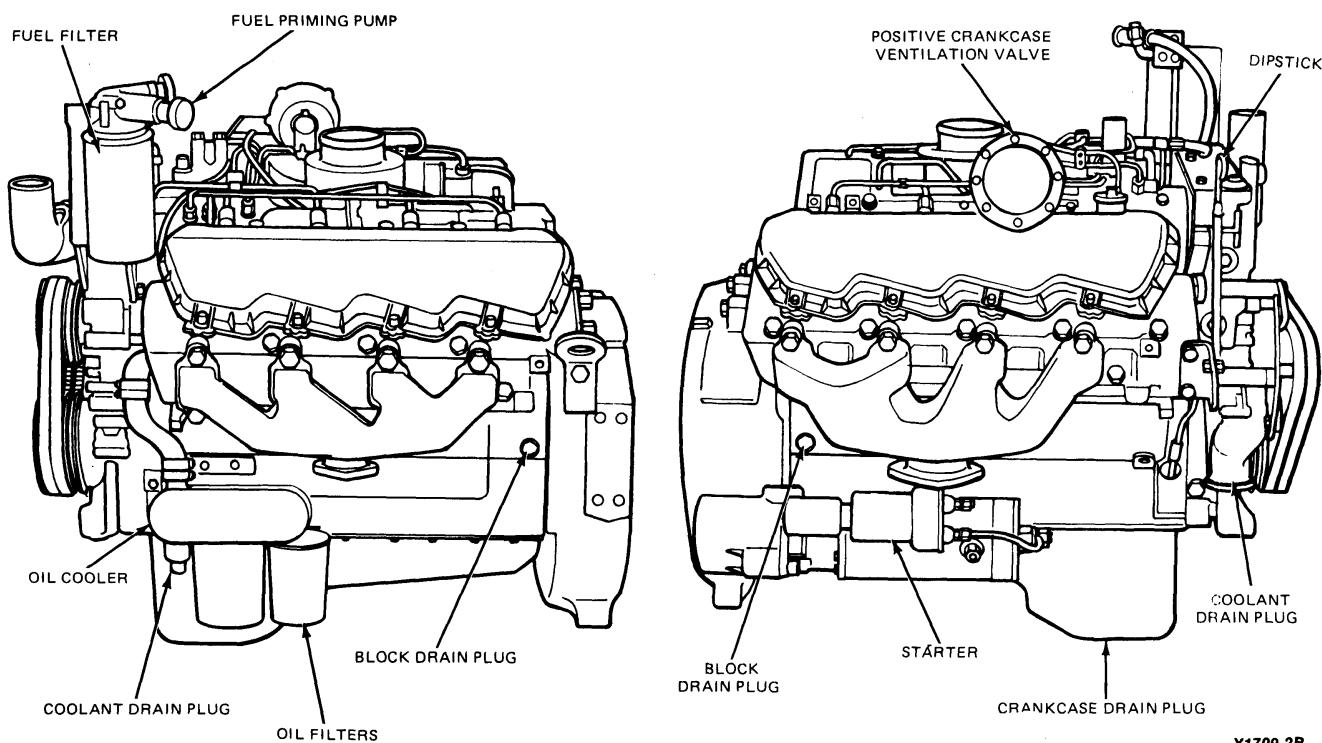


FIG. 2 Caterpillar 3208 V-8 Diesel Engine Service Points

11. Install the filter element and cover in the filter housing and make sure that the cover latches are tight.

It is recommended that the element be replaced after four cleaning cycles, regardless of appearance.

CHECK INLET AIR RESTRICTION

A restriction indicator located at the rear of the air cleaner signals the need for service. If the air cleaner

becomes completely clogged, the signal is locked down in full view. To check if the cleaner requires service, reset the indicator and run the engine at maximum governed speed. The indicator will again lock down if the cleaner is dirty.

PRIMING THE FUEL SYSTEM

Refer to Caterpillar Operator's Manual.

CUMMINS DIESEL ENGINES

LUBRICATION AND MAINTENANCE

Refer to the applicable Cummins Diesel Operation and Maintenance Manual, which is supplied with each vehicle, for lubrication and maintenance procedures, and specifications.

ACCELERATOR LINKAGE

Lubricate the friction points of the accelerator linkage with the specified lubricant (refer to the lubricants chart in Part 50-03, Lubrication Guide and Lubricant Specifications) at recommended mileage interval.

CHANGE BY-PASS OIL FILTER ELEMENT

Never use a by-pass filter in place of a full-flow filter.

Change by-pass filter elements, on engines so equipped, as follows: Refer to Figs. 3 and 4.

1. Remove drain plug from bottom of housing and drain oil.

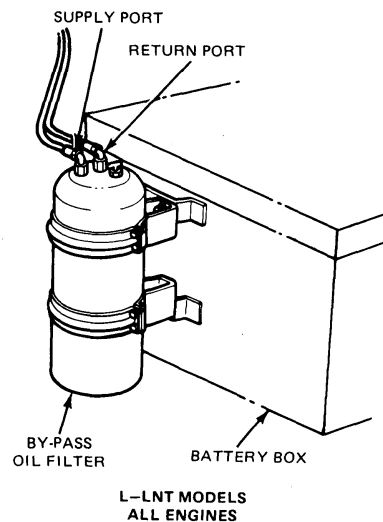


FIG. 3 By-Pass Oil Filter Installation Battery Box Mounted

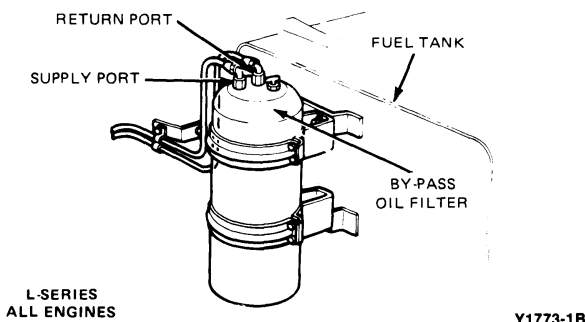


FIG. 4 By-Pass Oil Filter Installation Integral Fuel Tank Mounted

2. Remove clamping ring capscrew and lift off cover.
3. Unscrew pack hold-down assembly; lift out element and hold-down assembly (Fig. 5). Discard element

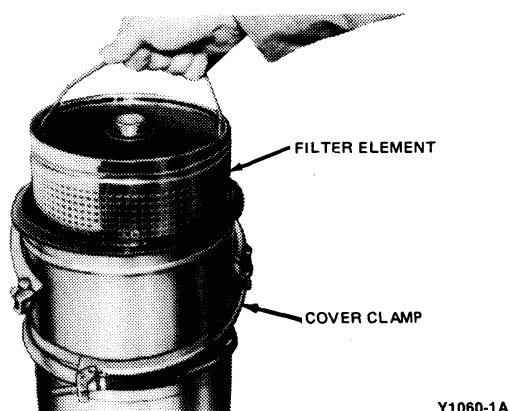


FIG. 5 By-Pass Filter and Element

4. Clean housing and hold-down assembly in solvent.
5. Inspect hold-down assembly spring and seal. Replace if damaged.
6. Inspect drain plug and connections. Replace plug.

DRAIN AND FILL COOLING SYSTEM

To prevent loss of anti-freeze when draining the radiator, attach a hose to the radiator drain cock and drain the coolant from the radiator into a clean container.

To drain the radiator, open the drain cock located at the bottom of the radiator. The cylinder block is drained by opening one drain plug located at the right rear of the block. Also, drain the oil cooler and heat exchanger (if so equipped).

To fill the cooling system, close the drain cocks. Venting is automatic.

On downflow radiators, operate the engine and add more coolant, if necessary, to fill the radiator to the proper level. On trucks without a supply tank, fill the radiator one inch above the baffle (or core). On trucks equipped with a supply tank, fill the supply tank 2/3 full.

On L-Series, fill until the coolant is 1 inch from the top of the tank with engine cold. **(CAUTION — DO NOT OPERATE ENGINE IF COOLANT LEVEL IS**

BELOW THE LOWER SIGHT GLASS.) The coolant level will drop approximately 1 quart after initial fill, when the engine has been operated about 20 minutes at 2000 rpm. This is due to displacement of entrapped air.

CLEAN COOLING SYSTEM

The cooling system must be clean to do its work properly. Dirt in the system slows down heat absorption from water jackets and heat rejection from the radiator. **Use clean water which will not clog any small passages in the radiator or water passages in the block.**

Clean out radiator cores, heater cores, oil cooler, and block passages which have become clogged with scale and sediment by chemical cleaning, neutralizing and flushing.

Pressure Flushing

Flush the radiator and block when anti-freeze is added or removed, or before installing a Corrosion Resistor on a used engine.

When pressure flushing the radiator, open the upper and lower hose connections and screw the radiator cap on tight. Remove thermostats from housing and flush block with water. Use hose connections on both upper and lower connections to make the operation easier. Attach the flushing gun nozzle to the lower hose connection and let water run until the radiator is full. When full, apply air pressure **gradually** to avoid damage to the core. Shut off air and allow radiator to refill, then apply air pressure. Repeat until water coming from radiator is clean. **Do not back-flush cooling systems that have a water shut-off valve in the heater system.**

Sediment and dirt settles into pockets in the block as well as the radiator core. Remove thermostats from housing and flush block with water. Partially restrict the lower opening until the block fills up. Apply air pressure and force water from the lower opening. Repeat the process until stream of water coming from block is clean.

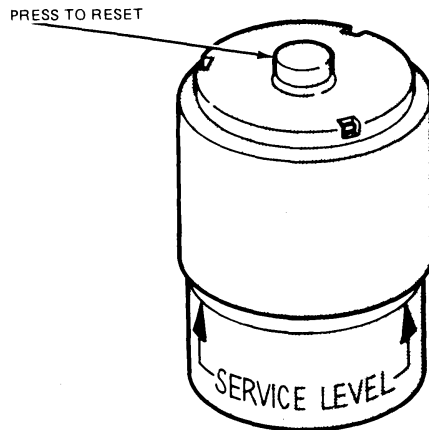
CHECK INLET AIR RESTRICTION

The best method for determining dry-type air cleaner maintenance periods is through air restriction checks.

Check Air Inlet Restriction at Engine

1. **On naturally aspirated engines**, attach a vacuum gauge or water manometer in the middle of the intake manifold or on the air intake piping. When located in the air intake piping, the adapter must be perpendicular to the air flow and not more than six inches from the air intake manifold connection.

On turbocharged or supercharged engines, attach the checking fixture on pipe diameter upstream from the supercharger or turbocharger in a straight section of tubing.
2. Idle the engine until normal operating temperature is reached.
3. Operate engine at rated speed full-load and take reading from vacuum gauge or manometer. Air restriction must not exceed 25 inches of water or 1.8 inches of mercury.
4. If air restriction exceeds limits:



V1330-1A

FIG. 6 Mechanical Restriction Indicator Gauge

Clean or replace dry-type cleaner element.

Replace damaged air piping, rain shield or housing.

Remove excessive bends or other source of restriction in air piping.

Check Air Inlet Restriction at Cleaner

A mechanical restriction indicator is installed on the air cleaner. The gauge shows completely red in the indicator window when restriction reaches 25 inches of water (Fig. 6).

DETROIT DIESEL ENGINES

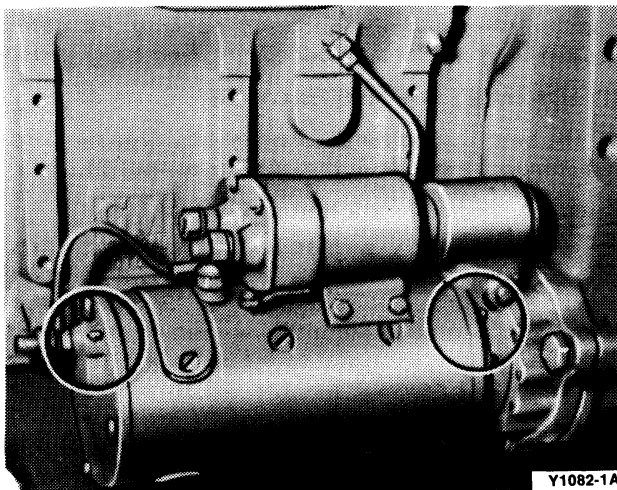
LUBRICATION

ACCELERATOR LINKAGE

Lubricate the friction points of the accelerator linkage with the specified lubricant (Part 50-03 Lubrication Charts and Lubricant Specifications) at the recommended mileage interval.

STARTER MOTOR

Some starting motors do not require lubrication except during overhaul. However, motors (Fig. 7) which are provided with lubrication fittings (grease cups, hinge cap oilers, or oil tubes sealed with pipe plugs) should be lubricated at the specified interval.



Y1082-1A

FIG. 7 Starter Motor Lubrication Points—Typical

Add 8 to 10 drops of oil, of the same grade as used in the engine, remove the pipe plugs, add oil and reseal the tubes.

ENGINE OIL LEVEL

Do not operate the engine with the oil level below the LOW mark.

Do not add oil to any engine to raise the oil level above the mark indicating FULL.

CHANGE ENGINE OIL

1. Remove the oil pan drain plug, drain oil into a container, then replace the plug.

Install new filter elements each time the oil is changed.

2. Fill the crankcase with the specified engine oil shown in the Owner's Manual.

Over-filling the crankcase may contribute to abnormal oil consumption, high oil temperatures, and may also result in oil leaking past the rear crankcase oil seal which was not intended to operate submerged in oil.

3. Operate the engine at fast idle and check for leaks.

MAINTENANCE

The following maintenance operations are to be performed **only by Detroit Diesel Service Dealers using the procedures in the applicable Detroit Diesel Service Manual:**

Check Fan Hub and Drive Pulley.

Check Thermostats.

Check Engine Blow-By.

Clean Injector Inlet Screen.

Clean Injectors.

Clean Blower Screen and Check Seals.

Clean Crankcase Breather.

Adjust Injectors and Valve Lash.

Tighten Mounting Bolts.

Check Engine Emergency Shut-Down Cable where applicable.

CLEAN COOLING SYSTEM

Drain and flush the cooling system to remove the anti-freeze solution in the spring and the rust inhibitor in the fall, thus preparing the cooling system for the next

coolant solution. If necessary, use a cooling system cleaner and reverse flush. Refill the cooling system with clean soft water and add rust inhibitor or anti-freeze. Start the engine and check for leaks.

CAUTION:—Do not backflush cooling systems that have a water shut-off valve in the heater system, or damage to the valve can result.

WATER FILTER AND CONDITIONER

For maintenance of the engine coolant and water filter, refer to the Detroit Diesel Engine Maintenance Manual.

DRAIN AND FILL COOLING SYSTEM

To drain the radiator, open the drain petcock at the bottom of the radiator and drain the coolant into a container to prevent loss of anti-freeze. The radiator will drain faster if the filler cap is removed.

To drain the cylinder block, open the two drain petcocks on each side of the engine block and on the bottom of the oil cooler.

To fill the cooling system, close the drain petcocks and pour the coolant into the radiator. Fill radiator with specified coolant. Operate the engine until operating temperature is obtained and check the coolant level.

CHECK COOLING SYSTEM HOSES

Check for deterioration or damage to hoses and replace, if necessary (Fig. 8). Check all of the hose clamps to make sure they are tight and properly seated on the hoses.

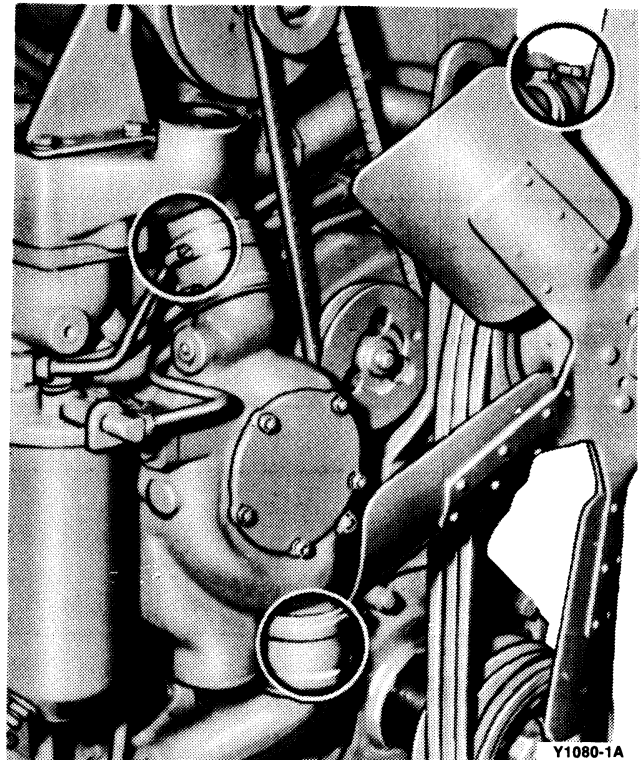


FIG. 8 Cooling System Hoses Check Points

Ignition Systems

**PART
50-23**

APPLIES TO ALL MODELS

SUBJECT	PAGE	SUBJECT	PAGE
MAINTENANCE		PRE-DELIVERY	50-23-1
Ignition Timing	50-23-1	SPECIFICATIONS	50-23-2

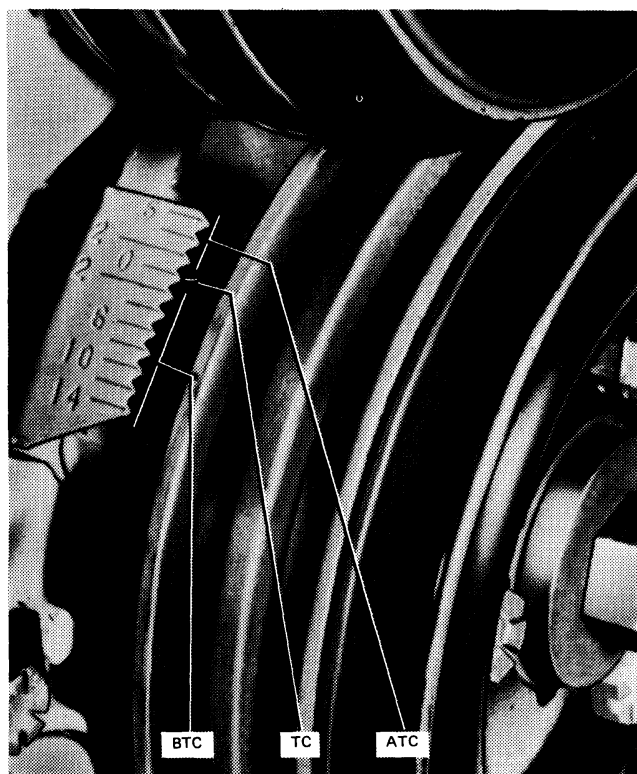
PRE-DELIVERY

Refer to Part 50-02.

MAINTENANCE IGNITION TIMING

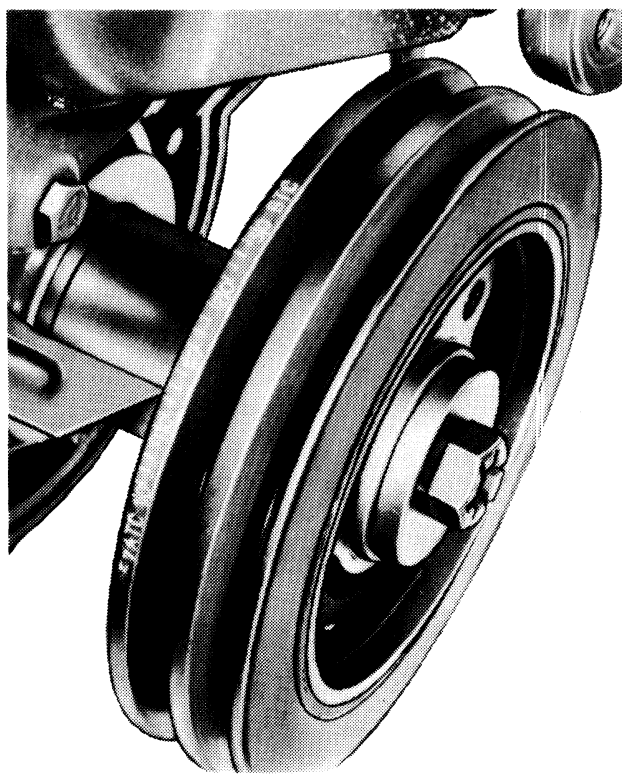
All engines are equipped with either conventional ignition timing or both conventional and "monolithic" timing features. The conventional system employs degree numbers (Figs. 1 and 2) on the crankshaft vibration damper.

The "monolithic" system employs a timing receptacle designed to accept an electronic probe (Fig. 3) that is connected to electronic read out equipment. Thus, the timing is determined electronically. The receptacle is located at the front of all engines.



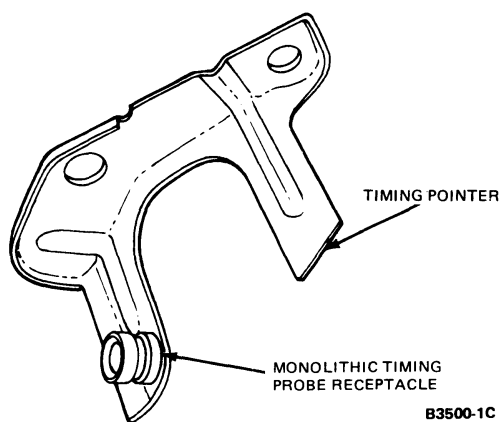
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FIG. 1 Typical Engine Timing Marks—Pointer Mounted



B3110-1A

FIG. 2 Typical Engine Timing Marks—Pulley Mounted



Refer to Part 29-02, Light Duty Engine Diagnosis and Service, and Part 50-29, Engine Emission Control Systems of the Truck Shop Manual for adjustment of initial ignition timing and for all other ignition tests and adjustments.

FIG. 3 Typical Timing Pointer and Probe Receptacle

SPECIFICATIONS

Refer to the Truck Performance Specifications Book, Truck Engine Manual, or Part 50-29 Engine Emission

Control Systems, of this manual for all ignition system specifications.

Fuel Systems — Gasoline

PART 50-24

APPLIES TO ALL MODELS

SUBJECT	PAGE	SUBJECT	PAGE
MAINTENANCE		MAINTENANCE (Cont'd.)	
Accelerator Pedal Operation	50-24-1	Inspect Fuel Lines and	
Adjust Carburetor	50-24-3	Filter for Leaks	50-24-1
Automatic Choke Operation	50-24-1	Replace Fuel Filter	
Check and Adjust Engine		Disposable Filter	50-24-2
Idle Speed	50-24-1	In-Line Fuel Filter —	
Check Fuel Tank Mounting	50-24-1	F-100 — F-350, Bronco,	
Check Oil Bath Air Cleaner		and E-100 — E-350	50-24-2
Oil Level	50-24-2	In-Line Fuel Filter —	
Clean Choke External Linkage	50-24-2	600-800 Series — with	
Check Throttle Linkage and		Electric Fuel Pump	50-24-3
Wide Open Throttle Position	50-24-1	Frame Mounted Fuel Filters	50-24-3
Clean Oil Bath Air Cleaner		Frame Mounted Fuel Filter —	
and Refill Reservoir	50-24-2	In-Line With 7.8L (477 CID)	
Draining Fuel Filter	50-24-3	and 8.8L (534 CID) Engines . . .	50-24-3
Inspect and/or Replace		PRE-DELIVERY	50-24-1
Carburetor Air Cleaner Filter	50-24-2	SPECIFICATIONS	50-24-4

PRE-DELIVERY

Refer to Part 50-02, for Gasoline Engine pre-delivery procedures.

MAINTENANCE

ACCELERATOR PEDAL OPERATION

Check for full return and sufficient pedal height to open throttle fully. (Remove air cleaner, hold choke plate open, depress accelerator pedal fully and observe position of throttle plate. Plate should be in vertical position.) Check for binding or looseness, and adjust, if necessary.

CHECK THROTTLE LINKAGE AND WIDE OPEN THROTTLE POSITION

Be sure linkage is properly installed. Remove the air cleaner, and with the accelerator fully depressed, observe the position of the carburetor throttle plate(s). They should be vertical (wide open position).

Check accelerator for sticking or binding and for full return and sufficient height to fully open throttle.

AUTOMATIC CHOKE OPERATION

Check the automatic choke for proper operation, check the choke cup for the proper setting. Check and

adjust the fast idle speed (Part 50-29, Engine Emission Control Systems) to specifications.

CHECK AND ADJUST ENGINE IDLE SPEED

Refer to Part 50-29, Engine Emission Control System, of this Manual for the engine idle adjustment procedures.

INSPECT FUEL LINES AND FILTER FOR LEAKS

With the engine stopped, examine the fuel line connections for wetness or washed or stained areas that might indicate a fuel leak. Start the engine and observe all the connections for fuel seepage. Tighten or replace fuel lines as necessary.

CHECK FUEL TANK MOUNTING

Inspect the fuel tank mounting brackets and straps to be sure the fuel tanks are securely attached to the

vehicle. Inspect the fuel line(s) at the tank(s) to be sure they do not leak. On light trucks the pressure/vacuum relieving gas cap(s) should be checked for any overt or obvious damage that could allow liquid fuel leakage. Make corrections as required.

CHECK OIL BATH AIR CLEANER OIL LEVEL

Refer to Part 50-29, Engine Emission Control Systems, for the recommended maintenance procedure.

CLEAN OIL BATH AIR CLEANER AND REFILL RESERVOIR

Refer to Part 50-29, Engine Emission Control Systems, for the recommended maintenance procedure.

CLEAN CHOKE EXTERNAL LINKAGE

Examine the choke external linkage. If it appears to be sticking, or is dirty, clean with a brush and common mineral spirits cleaning fluid.

INSPECT AND/OR REPLACE CARBURETOR AIR CLEANER FILTER

Refer to Part 50-02, Maintenance Schedule, for recommended frequency of filter inspection and/or replacement.

Removal

1. Remove the wing nuts retaining the air cleaner (and duct if so equipped) assembly to the carburetor. Disconnect the crankcase ventilation system hose at the air cleaner. Disconnect the evaporative emission system hose at the air cleaner.
2. Remove the air cleaner (and duct if so equipped) assembly from the carburetor. **To prevent dirt from entering the carburetor, the filter element must never be removed when the air cleaner body is mounted on the carburetor.**
3. Remove the air cleaner cover and filter element. Discard the air cleaner mounting gasket if it is excessively worn or damaged.

Inspection

Visually inspect the element for damage. Look for dust on the clean air side, the slightest rupture, or damaged end seals. A good method to detect ruptures in the element is to place a light inside the element and look toward the light from the outside. Any hole in the element, even the smallest, is cause to replace the element. Also, check the element for any charred or brittle spots that might fail under vibration and cause a hole to occur. Discoloration only, caused by backfire, is not cause for element replacement.

Installation

1. Install a new air cleaner mounting gasket on the carburetor, if necessary.
2. Wipe clean all inside surfaces of air cleaner before installing filter element.
3. Install the air cleaner body on the carburetor or position the air cleaner and air intake duct and valve assembly on the carburetor and shroud tube if so equipped, so that the word FRONT faces the front of the car.

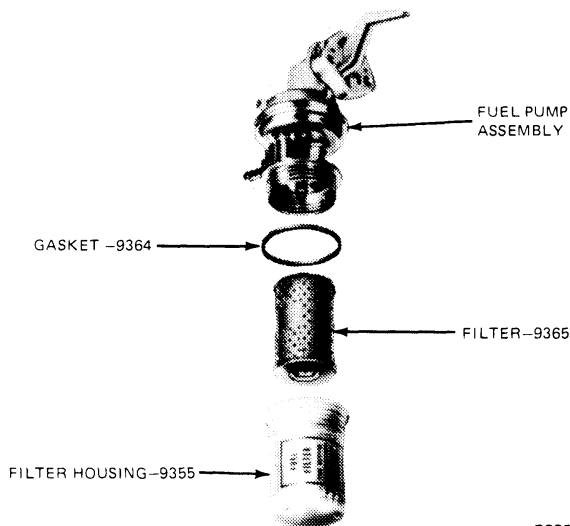
4. Place the air cleaner filter element in the air cleaner body.
5. Install the cover and tighten the wing bolt or nut to the specified torque.
6. Connect the crankcase vent hose to the air cleaner. Connect the evaporative emission hose to the air cleaner.

Make sure the filter is properly seated. If the word TOP is indicated on the filter element, make sure the word TOP faces up.

REPLACE FUEL FILTER

DISPOSABLE FILTER

1. Unscrew the filter housing from the fuel pump, and remove the filter element and gasket. Discard the element and gasket. Clean the filter housing in cleaning solvent.
2. Place a new filter element over the spout in the fuel pump valve housing cover. **Be sure to use the proper type element for the installation.** Coat a new gasket with light engine oil and position the gasket on the filter housing (Fig. 1). Thread the filter housing onto the fuel pump. Hand tighten the filter housing until the gasket contacts the pump, and then advance it one-eighth turn.



82322-1C

FIG. 1 Typical Carter Sealed Design Fuel Pump Assembly—6.1L (370 CID) and 7.0L (429 CID) Engines

3. Start the engine and check for leaks.

IN-LINE FUEL FILTER—F-100—F-350, BRONCO, AND E-100—E-350

The in-line fuel filter used on most engines is of one piece construction and cannot be cleaned. Further maintenance is not required. Replace the filter if it becomes restricted.

1. Remove the air cleaner.
2. Loosen the retaining clamp securing the fuel inlet hose to the fuel filter.
3. Unscrew the fuel filter from the carburetor. Disconnect the fuel filter from the hose and discard the retaining clamp.

4. Install a new clamp on the inlet hose and connect the hose to the filter. Thread filter into the carburetor inlet port. Tighten the filter.
5. Position the fuel line hose clamp and crimp or tighten the clamp securely.
6. Start the engine and check for fuel leaks.
7. Install the air cleaner.

IN-LINE FUEL FILTER—600-800 SERIES—WITH ELECTRIC FUEL PUMP

1. Unscrew the lower section from the upper section and remove the filter element and gasket (Fig. 2). Discard the element and gasket.

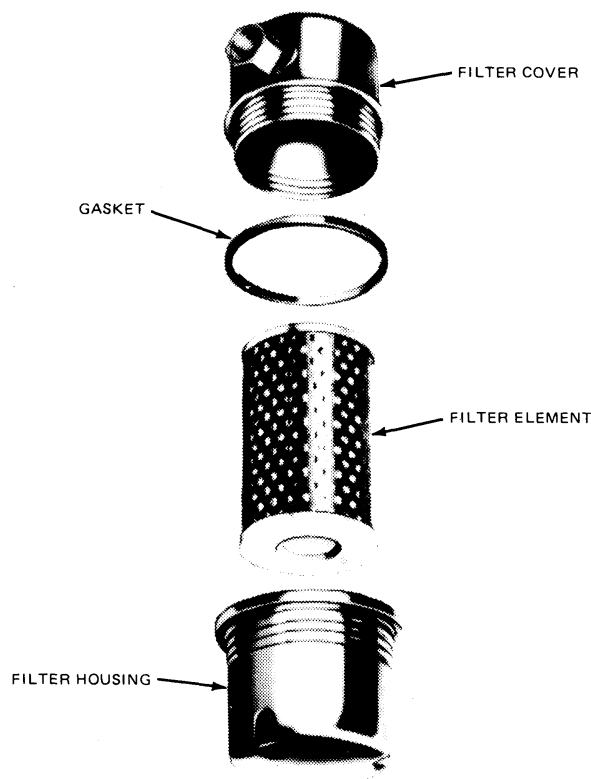


FIG. 2 Typical In-Line Fuel Filter—600-800 Series With Electric Fuel Pump

2. Clean the lower section in cleaning solvent. Clean the upper section with a cloth.
3. Coat a new gasket with light engine oil and position the gasket on the lower section.
4. Place a new filter element in the lower section.
5. Thread the lower section onto the upper section until the gasket contacts the upper section. Turn the lower section an additional one-eighth turn.

FRAME MOUNTED FUEL FILTER—IN-LINE WITH 7.8L (477 CID) AND 8.8L (534 CID) ENGINES

1. Remove drain plug (Fig. 3) and drain fuel from bowl.
2. Remove center bolt.

3. Remove bowl element and gasket.
4. Clean bowl and install new element and gasket.
5. Secure with center bolt through bowl.

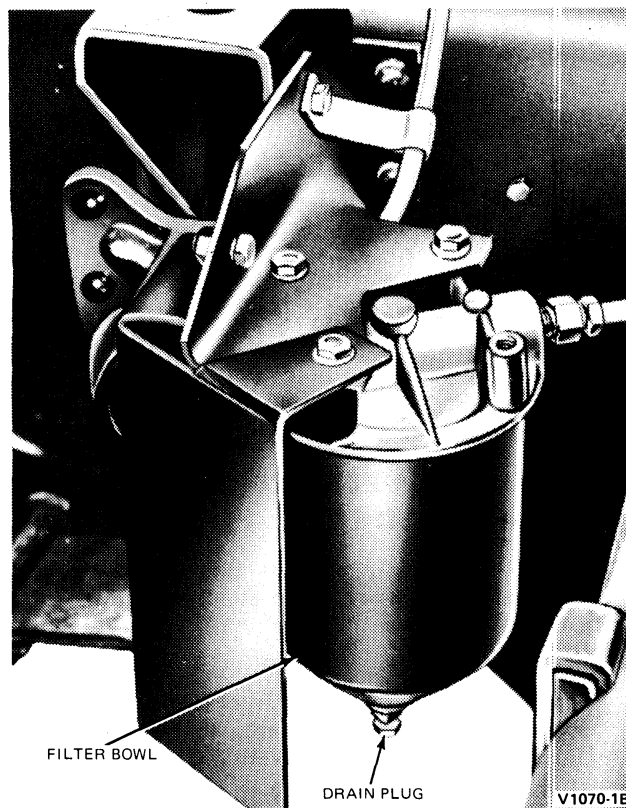


FIG. 3 Frame-Mounted Fuel Filter—In-Line with 7.8L (477 CID) and 8.8L (534 CID) Engines

DRAINING FUEL FILTER

(Refer to Maintenance Schedule, Part 50-02, for mileage interval)

1. Scribe a reference mark on the filter body and a mark in line with the reference mark on the filter container to be sure filter torque is not disturbed.
2. Remove the drain plug. (Be sure the filter does not turn). Drain the fuel from the filter.
3. Install the drain plug using a 5/8 box wrench on the filter as a backup wrench. Tighten the drain plug to a minimum of 5.4 N·m (48 in-lbs). (Be sure the filter container does not turn when torque is applied to the drain plug.)

ADJUST CARBURETOR

Refer to Group 24, Part 29-02, Light Duty Engine Diagnosis and Service, and Part 50-29, Engine Emission Control System, for the recommended carburetor adjustment procedures.

SPECIFICATIONS

Refer to Group 24, Fuel Systems—Gasoline Engines and the Truck Specifications Book for Fuel System Specifications.

Exhaust Systems

PART
50-26

APPLIES TO ALL MODELS

SUBJECT	PAGE	SUBJECT	PAGE
MAINTENANCE		MAINTENANCE (Cont'd.)	
Check Exhaust Control Valve	50-26-1	Inspect Exhaust System	50-26-1
Exhaust Heat Control Valve 4.9L (300 CID) I-6 (w/10,000 GVW Only)	50-26-1		

MAINTENANCE

CHECK EXHAUST CONTROL VALVE (IF SO EQUIPPED)

Check the thermostatic spring of the valve to make sure it is hooked on the stop pin. The spring stop is at the top of the valve housing when the valve is properly installed.

Make sure the spring holds the valve closed. Actuate the counterweight by hand to make sure it moves freely through approximately 90 degrees of rotation without binding.

The valve is closed when the engine is cold (Fig. 1). However, a properly operating valve will open when very light finger pressure is applied to the counterweight. Rapidly accelerate the engine to make sure the valve momentarily opens. The valve is designed to open when the engine is at normal operating temperature and is operated at high rpm.

Lubricate and free the valve with the specified solvent (Part 50-03 Lubrication Charts and Lubricant Specifications) if the valve is sluggish or stuck.

EXHAUST HEAT CONTROL VALVE (4.9L (300 CID) I-6 U/10,000 G.V.W. Only)

If fuel condenses on the cold surfaces of the fuel induction system, fuel/air ratios fluctuate. These variations can cause uneven acceleration and increased emission levels. The exhaust heat control valve is designed to provide quick induction system warm-up and better cold engine fuel/air ratio control. The thermostatically controlled valve is located between the exhaust manifold and one branch of the exhaust pipe.

While the engine is cold, the valve is closed and routes hot exhaust gas through a passage under the carburetor. This quickly warms the air-fuel mixture delivery passages, thus providing improved air-fuel ratio control. As the engine warms up and the valve opens, this action reduces exhaust gas flow through the warm-up passage to prevent excessive heat.

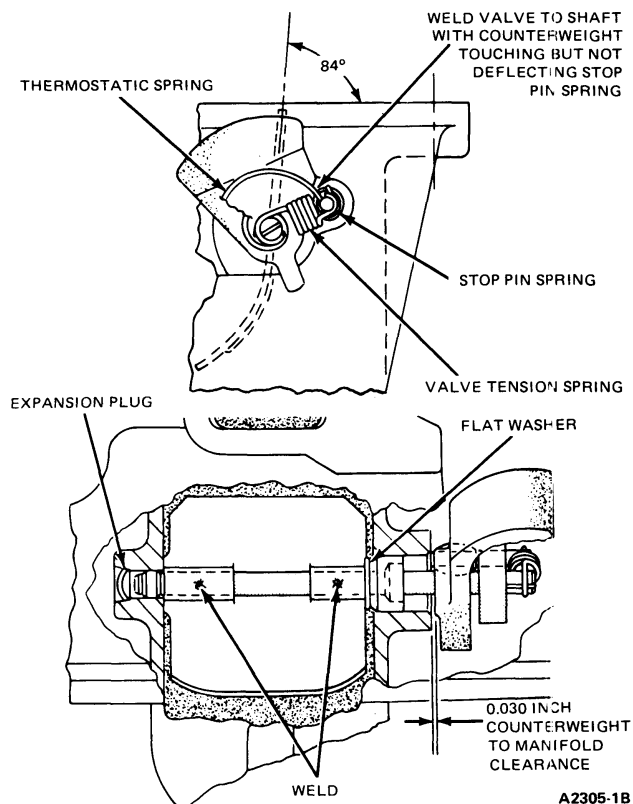


FIG. 1 Engine Exhaust Control Valve—Typical
INSPECT EXHAUST SYSTEM

The system must be free of leakage, binds, groundings, and restrictions. Check the exhaust manifold, pipe connections and exhaust system hangers to be sure they are securely attached.

Leaks can usually be detected visually by carbon stains, or in some cases, a whistling noise may be heard at the pipe connections. Check the various sections of the exhaust system for signs of leaking or burning through.

Muffler inlet and outlet pipes and the various pipe connectors must overlap sufficiently to prevent leakage, the locating tab of one pipe must fit into the mating slot of the overlapping pipe, and provide enough overlap to support proper tightening of the retaining clamp(s). Replace all sections that show signs of burning through.

Exhaust system grounding or binds are usually caused by loose, broken or improperly aligned clamps or brackets; improper installation of the inlet pipe flange on the exhaust manifold; or improper pipe connections. Any of these conditions may cause changes in the clearances of the exhaust system components. If any of these conditions exist, the exhaust system components must be checked and

adjusted to make certain clearances are maintained. Use only the released clamps and U-bolts for service replacement.

Check heat and brush shields to be sure their attachments are tight and they are not bent or in contact with inlet pipes, converters or muffler assemblies. Make sure foreign matter like grass, leaves or other combustibles are removed since they tend to reduce shield effectiveness. Replace shields that are badly bent or corroded.

Inspect the exhaust system frame and body supports. Replace as required.

Check the flopper valve operation and direction (if so equipped). Repair or replace as required.

Cooling System

**PART
50-27**

APPLIES TO ALL MODELS

SUBJECT	PAGE	SUBJECT	PAGE
LUBRICATION		MAINTENANCE (Cont'd.)	
Radiator Shutter Assembly	50-27-1	Drain and Fill the Cooling System	
MAINTENANCE		Gasoline Engines Without	
Adding Coolant Mixture	50-27-2	Coolant Recovery System	50-27-2
Check Anti-Freeze Protection	50-27-1	Vehicles with Coolant	
Check Radiator Coolant Level	50-27-1	Recovery Systems	50-27-2
Check the Cooling System		PRE-DELIVERY	50-27-1
Hoses and Lines	50-27-3	SPECIFICATIONS	50-27-3
Clean Radiator Sight Glass —			
L-Series	50-27-3		

PRE-DELIVERY

Refer to Part 50-02, for cooling system pre-delivery procedures.

LUBRICATION

RADIATOR SHUTTER ASSEMBLY

On 1980 trucks with shutters, lubricate the radiator shutter, pivot rods and arms with SAE 10W engine oil.

MAINTENANCE

CHECK RADIATOR COOLANT LEVEL

Engine should be at normal operating temperature.

In addition to maintaining the correct coolant level, the radiator fins must be cleaned and the cooling system inspected periodically for leaks in order to be sure the system operates at maximum efficiency.

NEVER remove the radiator cap under any conditions while the engine is operating. Switch the engine off and wait until it is cooled. Then if the radiator is still hot, carefully muffle the radiator cap in a thick cloth and turn it slowly counterclockwise only until the pressure starts to escape. After the pressure has completely dissipated, finish removing the cap.

Check the cooling system for dirty or rusty appearance. Dirty or rusty coolant requires replacement to protect the cooling system from corrosion damage.

On E-100—E-350, the coolant level should be approximately 25-40 mm (1-1.6 inch) below the bottom of the radiator filler neck. On vehicles with an expansion tank, fill the tank 2/3 full. On F-100—F-350 and Bronco models, fill the radiator (with engine cold)

until the coolant is flush with the cap seal surface in the radiator filler neck.

Use only a permanent type coolant that meets Ford Specification ESE-M97B18-C or equivalent. Do not use alcohol or Methanol or mix them with the specified coolant.

CAUTION: BE CAREFUL WHEN REMOVING THE RADIATOR CAP TO AVOID INJURY FROM ESCAPING STEAM OR HOT WATER.

On L-Series gasoline and Ford V-8 Diesel engines, with crossflow radiators, fill until the coolant is visible through the sightglass (engine cold).

CAUTION: Do not operate engine if coolant level is below sightglass.

On L-Series Cummins and Detroit Diesel engines, fill until the coolant is visible through the sightglass (engine cold).

CHECK ANTI-FREEZE PROTECTION

Be sure the engine is at operating temperature. Check the anti-freeze in the cooling system by using an

ethylene glycol test hydrometer or the Rotunda anti-freeze tester (Model 72005) or equivalent. Standard protection is to -28°C or -20°F (-37°C or -35°F for Canadian and Alaskan vehicles and some U.S. regions) with a solution of Ford Permanent Anti-Freeze or an equivalent and water. The freeze protection of engine should be maintained at an adequate level for the temperatures which may occur in the area in which the vehicle will be operated.

Regardless of the freeze protection required for gasoline engines during cold weather, it must be maintained at least to -17°C (0°F) to provide adequate corrosion and boiling protection.

DRAIN AND FILL THE COOLING SYSTEM

GASOLINE ENGINES WITHOUT COOLANT RECOVERY SYSTEM

To prevent loss of anti-freeze when draining the radiator, attach a hose on the radiator drain cock and drain the coolant from the radiator into a clean container.

To drain the radiator, open the drain cock located at the bottom of the radiator and remove the radiator or supply tank cap. The cylinder block of the V-8 engine is drained by removing the drain plugs located on both sides of the block. The 6-cylinder engines have one drain plug located at the left rear of the cylinder block.

To clean the system, flush with clear water and if excessively dirty or rusty, the use of Ford radiator flush or equivalent and/or reverse pressure flushing is recommended. Drain and flush expansion bottle system (if so equipped).

To fill the cooling system, install the cylinder block drain plug(s) and close the radiator drain cock. On E-100—E-350, F-100—F-350 and Bronco, disconnect the heater outlet hose at the water pump to bleed or release trapped air in the system. When the coolant begins to escape, connect the heater outlet hose.

On C-900 Series trucks with super duty engine, open the air vent valve located at the front of the intake manifold to bleed the system. When coolant begins to escape at the opening, close the valve finger-tight. **Do not overtighten, as the air vent valve is designed to be closed finger-tight only.**

On E-100—E-350, operate the engine and add more coolant, if necessary, to fill the radiator to 19.05mm (3/4 inch) below bottom of radiator filler neck on trucks without a supply tank, fill the radiator one inch above the baffles (or core). On trucks equipped with a supply tank, fill the supply tank 2/3 full. On F-100 — F-350 and on E-100 — E-350, fill to 3/4 inch below the bottom of the radiator filler neck. On Bronco, fill the radiator (with engine cold) until the coolant is flush with cap seal surface of filler neck.

On L-Series equipped with crossflow radiators, fill until the coolant is 63.50mm (2-1/2 inch) from the top of the tank (engine cold).

CAUTION: Do not operate engine if coolant level is below sightglass.

When the cooling system has been drained, follow these radiator coolant refilling instructions.

1. Fill the radiator, through the filler cap opening of the radiator upper tank completely full. **The locking type radiator cap may be removed by turning to the stop and, pressing down on the cap, force the cap past the stop tangs on the filler neck.** When filling radiator, the engine should be running at idle speed to circulate the coolant and eliminate any trapped air in the system.
2. Install the radiator cap.

VEHICLES WITH COOLANT RECOVERY SYSTEM—MEDIUM/HEAVY TRUCKS

The engine coolant recovery system incorporates a new radiator pressure cap and a new radiator coolant recovery reservoir assembly (Fig. 1).

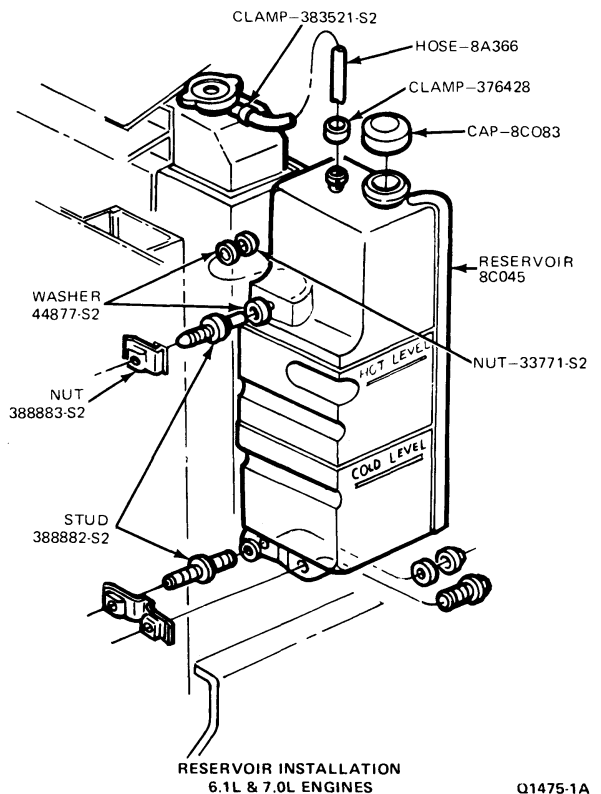


FIG. 1 Coolant Recovery System—Medium/Heavy Trucks

1. Fill the coolant reservoir with one quart of coolant.
2. Operate the engine until it reaches normal temperature. Check the coolant reservoir to see if the coolant level is at the **Engine Hot** level. If necessary, add coolant to bring it to this level.

NOTE: The new design locking-type radiator cap assembly should not be removed to check the coolant level. The filler neck of the radiator upper tank incorporates a built-in stop that prevents complete removal of the radiator cap under normal conditions. If necessary, add coolant to the reservoir only.

Medium Trucks

On L and C-Series vehicles equipped with this system, add coolant to the plastic reservoir only.

Maintain level at the COLD or HOT fill marks on reservoir.

When the cooling system is drained and is to be refilled, first fill the radiator with coolant; then, vent the system by disconnecting the upper heater hose and add fluid to bring the level to the proper mark on the recovery reservoir.

ADDING COOLANT MIXTURE

To prevent damage to the cooling system during periods of below freezing ambient temperature, when water or anti-freeze is added to the supply tank, always operate the engine at fast idle for 30 minutes before letting the truck stand with the engine off for prolonged periods. This will allow a uniform mixture throughout the cooling system and prevent damage by freezing, when sufficient anti-freeze is used.

When adding coolant, a mixture of Ford Permanent Anti-Freeze and water is recommended or an equivalent. In production, the cooling system is filled with a 50-50 solution of anti-freeze to water, which provides protection to -37°C (-35°F). For the most effective cooling system operation, this mixture should be maintained all year and in all climates.

Ford Permanent Anti-Freeze may be added undiluted if anti-freeze protection below -37°C (-35°F) is required. Refer to the coolant mixture charts on the container. **To avoid possible overheating in very hot weather, do not use mixtures with more than 50 percent anti-freeze except in areas where a protection below -37°C (-35°F) is required.**

Ordinary tap water may be used in an emergency except in areas where the water is known to be

exceptionally hard or to have a high alkali content. The cooling system should be drained and flushed and the proper mixture added as soon as possible, however.

On medium/heavy trucks, do not add any radiator sealers containing water soluble oil to the cooling system, as it will make the corrosion resistor (water filter) inoperative.

After the initial fill, the coolant level will drop approximately one quart when the engine has been operated about 20 minutes at 2000 rpm. This is due to the displacement of entrapped air.

After filling, re-check the coolant protection level.

CLEAN RADIATOR SIGHT GLASS—L-SERIES

When coolant level is difficult to see, unscrew sightglass from radiator. Wipe the glass with a clean damp cloth to remove any residue and replace the sight glass. Tighten to 1.0-1.5 N·m (9-13 in-lbs).

CHECK THE COOLING SYSTEM HOSES AND LINES

Bring the engine to normal operating temperature and turn the engine off. With the cooling system under pressure, inspect for evidence of cracking, extreme weathering, or leaking or porous hoses. Tighten or replace, if necessary.

Inspect the radiator core and tanks for seepage or leaks.

Inspect radiator cap, filler neck and gasket for dirt or damage. Clean or replace, if necessary. See Part 27-02 Ford Cooling System Service.

SPECIFICATIONS

COOLING SYSTEM CAPACITIES — MEDIUM TRUCK

Engine	Vehicle Series	Cooling System Approximate Capacities (a)		
		U.S. Quarts	Imperial Quarts	Litres
370-2V	F-B-600, 700	23.0 (b)	19.1	21.8
		25.5 (c)	21.2	24.1
	LN-600	25.5 (b)	21.2	24.1
		34.0 (c)	28.2	32.2
	C-600	22.5 (b)	18.7	21.3
		27.5 (c)	22.8	26.0
370-4V	F-B-600-700	23.5 (b)	19.5	22.2
		25.5 (c)	21.2	24.1
	LN-600-700	26.5 (b)	22.0	25.1
		34.0 (c)	28.2	32.2
	C-600-700	23.0 (b)	19.1	21.8
		27.5 (c)	22.8	26.0
429-4V	F-700	21.0 (b)	17.4	19.9
		22.5 (c)	18.7	21.3
	LN-700	24.5 (b)	20.3	23.2
		31.0 (c)	25.7	29.3
	C-700	21.0 (b)	17.4	19.9
		24.5 (c)	20.3	23.2

(a) Add 1 U.S. quart (or equivalent Imperial quarts or litres) for trucks equipped with heater.

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(b) With manual transmission.

(c) With automatic transmission.

COOLING SYSTEM CAPACITIES — HEAVY TRUCK

Engine	Vehicle Series	Cooling System Approximate Capacities (a)		
		U.S. Quarts	Imperial Quarts	Litres
7.8L (477 CID) V-8	L-900	46.0	38.3	43.5
8.8L (534 CID) V-8	LN-900	48.6 (c)	40.0	45.4
7.8L (477 CID) V-8	C, CT-900	51.0	42.5	48.2
8.8L (534 CID) V-8	LT, LTS, LNT-900	58.0 (c)	48.5	54.8
370-4V	L, LT, LTS, LN, LNT-800	26.0	21.6	24.6
429-4V	L, LT, LTS, LN, LNT-800	23.0	19.1	21.8
429-4V	C, CT-800	21.0 (b)	17.4	19.9
		24.5 (b)	20.3	23.2
429-4V	F-800	21.0 (b)	17.4	19.9
		22.5 (c)	18.7	21.3
Diesel Engines				
Ford 10.4L (V636 CID) (175 H.P.)	CT-8000	45.0	37.5	42.6
	L, LT, LN, LNT	37.0	31.0	35.0
	LTS-8000	39.0	32.5	36.9
Ford 10.4L (V636 CID) (210 H.P.)	L, LT, LN, LNT,	39.0	32.5	36.9
	LTS-8000	42.0	35.0	39.7

(a) Add 1 U.S. quart (or equivalent in Imperial quarts or litres) for trucks equipped with heater.

(b) With manual transmission.

(c) With automatic transmission.

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ENGINE COOLING SYSTEM REFILL CAPACITIES — F-100 THROUGH F-350, BRONCO, AND E-100 THROUGH E-350

Engine	Truck Model/Type	Equipment	Approximate Capacity		
			U.S. Quarts	Imperial Quarts	Litres
4.9L (300 CID) I-6	F-100/350	Manual Trans. — Standard and Extra Cooling	13	10	12
	F-100/350	Auto. Trans. — Standard and Extra Cooling	14	11	13
	F-100/350	Manual/Auto. Trans. — A/C	17	14	16
5.0L (302 CID) V-8	F-100/150	Manual/Auto. Trans. — Standard Cooling; Manual Trans. — Extra Cooling	15	12	14
	F-100/150	Auto. Trans. — Extra Cooling; Manual/Auto. Trans. — A/C	18	15	17
5.8L (351 CID)	F-100	Manual Trans. — Standard Cooling	17	14	16
	F-150/350	Manual Trans. — Standard Cooling	15	12	14
	F-100	Manual Trans. — Standard and Extra Cooling	17	14	16
	F-150/350	Manual Trans. — Extra Cooling; Auto. Trans. — Standard and Extra Cooling	17	14	16
	F-150/350	Manual/Auto. Trans. — A/C	18	15	17
	F-100/350	Manual/Auto. Trans. — Super Cooling	24	19	23
6.6L (400 CID)	F-250/350	Manual Trans. — Standard and Extra Cooling, and A/C	18	15	17
	F-100/350	Auto. Trans. — Standard and Extra Cooling, and A/C	18	15	17
	F-250/350	Manual Trans. — Super Cooling	24	19	23
	F-100/350	Auto. Trans. — Super Cooling	24	19	23
5.8L (351 CID)	Bronco	Manual Trans. — Standard Cooling	20	16	19
		Extra Cooling	22	18	21
		Air Conditioning			
		Auto. Trans. — Standard Cooling			
		Extra Cooling			
		Air Conditioning			
		Heavy Duty Trailer Towing Package			
6.6L (400 CID)	Bronco	Super Cooling	24	19	23
		All — Except Super Cooling	22	18	21
		Super Cooling	24	19	23
4.9L (300 CID)	E-100 — E-350	With Manual and Automatic Trans. Without Air Conditioning ① ②	15	12	14
		With Air Conditioning ① ②	20	16	19
		Standard Manual Trans. — Extra Cooling	15	12.5	14.2
5.0L (302 CID) V-8	E-350	Automatic Trans. — Extra Cooling — A/C	17.5	14.5	16.6
		Manual Trans. — With Air Conditioning ① ②	15	12	14
5.8L (351 CID)	E-100 — E-150	Automatic Trans. — With/without Air Conditioning ① ②	20	16	19
5.8L (351 CID)	E-250 — E-350	All Except Super Cool	20	16	19
		Super Cool Option	27	22	25
6.6L (400 CID)	E-250 — E-350	All Except Super Cool	20	16	19
		Super Cool Option	27	22	25
7.5L (460 CID)	E-350	All Options ① ②	28	23	26

① Add 1 U.S. quart (or equivalent Imperial quarts or litres) for heater.

② Add 1.8 U.S. quarts (or equivalent Imperial quarts or litres) for auxiliary heater (Econoline models).

SPECIAL TOOLS

Number	Description
210012	Cooling System Pressurization Kit
720002	Cooling System Pressurization Kit
720005	Anti-Freeze Tester
750001	Cooling System Analyzer

Engine Emission Control Systems

**PART
50-29**

APPLIES TO ALL MODELS

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GENERAL INFORMATION

An Emission Systems Required Maintenance Chart for each truck model is listed on the following pages.

The Emission Systems Required Maintenance Chart lists the items required to maintain the vehicle emission systems at levels determined by the Federal Government (Environmental Protection Agency). Directly following the charts are a number of Maintenance Procedures, each of which is related to an item listed on the maintenance schedule. Use these procedures to perform the required emission system maintenance items listed on the maintenance charts.

Maintenance service adjustments must conform to specifications contained herein, to those listed in the Truck Performance Specifications Book or shown on the Vehicle Emission Control Information Decal which is located on or near the engine (Fig. 1), or the emissions systems may become inoperative.

If an engine is equipped with a "Dura-Spark" ignition system and any high tension ignition wire was detached from a spark plug, the distributor cap, or the coil to perform a maintenance operation, silicone grease (Ford #D7AE-19A331-A or equivalent) must be applied to the boot before re-connection. Using a small clean screw driver, apply a thin layer of silicone grease on the entire interior surface of the boot.

As a safety precaution, before starting the engine to perform maintenance, make sure the transmission selector is in Park (Automatic Transmission) or Neutral (Manual Transmission), the parking brake set and the wheels blocked.

IN GENERAL, MAINTENANCE REPLACEMENT, OR SERVICE OF THE EMISSION CONTROL DEVICES OR SYSTEMS IN YOUR NEW FORD VEHICLE OR FORD ENGINE MAY BE PERFORMED AT YOUR EXPENSE BY

ANY AUTOMOTIVE REPAIR ESTABLISHMENT OR INDIVIDUAL USING AUTOMOTIVE PARTS EQUIVALENT TO THOSE WITH WHICH YOUR VEHICLE OR ENGINE WAS ORIGINALLY EQUIPPED. IF OTHER THAN FORD OR MOTORCRAFT SERVICE PARTS OR FORD AUTHORIZED, REMANUFACTURED PARTS ARE USED FOR MAINTENANCE REPLACEMENTS OR FOR THE SERVICE OF COMPONENTS AFFECTING EMISSION CONTROL, THE OWNER SHOULD ASSURE HIMSELF THAT SUCH PARTS ARE WARRANTED BY THEIR MANUFACTURER TO BE EQUIVALENT TO GENUINE FORD MOTOR COMPANY PARTS IN PERFORMANCE AND DURABILITY. FORD, HOWEVER, ASSUMES NO LIABILITY WHATSOEVER, UNDER THE EMISSION CONTROL SYSTEM OR ANY OTHER WARRANTY WITH RESPECT TO PARTS OTHER THAN FORD SERVICE PARTS OR FORD AUTHORIZED REMANUFACTURED PARTS. THE EMISSIONS CONTROL SYSTEMS WARRANTY COVERS THE EMISSION CONTROL DEVICES AND SYSTEMS. PLEASE CONSULT YOUR WARRANTY FACTS BOOKLET FOR WARRANTY INFORMATION.

MAINTENANCE SCHEDULE APPLICABLE TO BRONCO, E-100, E-150, E-250, E-350 AND F-100, F-150, F-250, F-350 TRUCKS

Three maintenance schedules are specified for the 1980 model Bronco, Econoline and F-Series trucks. They are identified by the letters B, E and L, as follows:

BRONCO

The "B" maintenance schedule is required for all unleaded fuel engines (All U.S. Vehicles).

The "L" maintenance schedule is required for all Canadian leaded fuel vehicles with 5.0L (302 C.I.D.) engines.

The "E" maintenance schedule is required for all other Canadian leaded fuel engines.

ECONOLINE—E-100 THRU E-350

E-100 Vehicles Only

All E-100 vehicles have the "B" maintenance schedule.

E-150 and E-250 Vehicles

All E-150 and E-250 vehicles sold in the U.S. have the "B" maintenance schedule, except 11/12 Passenger Club Wagon. Canadian E-150 and E-250

vehicles have the "E" maintenance schedule, except those with the 5.0L (302 CID) engine.

E-350 Vehicles and E-250 11/12 Passenger Club Wagons (U.S.)

All E-350 vehicles, regardless of the engine size, and E-250 11/12 Passenger Club Wagons (U.S.), have the "E" maintenance schedule.

NOTE—Canadian leaded fuel E-150/250 vehicles with 5.0L (302 CID) engines use the "L" schedule.

F-SERIES—F-100 THRU F-350

F-100 Vehicles Only

All F-100 vehicles have the "B" maintenance schedule.

F-150 and F-250 Vehicles

All F-150 and F-250 vehicles sold in the U.S. have the "B" maintenance schedule.

Canadian F-150 and F-250 vehicles with leaded fuel engines have the "E" maintenance schedule except for the 5.0L (302 C.I.D.) engine which uses the "L" schedule.

F-350 Vehicles Only

All F-350 vehicles, regardless of engine size, have the "E" maintenance schedule.

MAINTENANCE SCHEDULE APPLICABLE TO MEDIUM DUTY AND HEAVY DUTY TRUCKS OVER 8,500 POUNDS GVW

Two emission system maintenance schedules, E and P, are applicable to 1980 model year Medium Duty Trucks and Heavy Duty Trucks over 8,500 pounds GVW. Maintenance schedule "E" applies to trucks equipped with the 6.1L (370 CID), 6.6L (400 CID) or 7.0L (429 CID), engines. Maintenance schedule "P" applies to trucks equipped with the 7.8L (477 CID) or 8.8L (534 CID) engines.

NOTE: 1980 vehicles built after January 1, 1980 will be equipped with engines which have been certified as complying with 1980 Emission Standards. Certain 1980 vehicles built prior to that date may be equipped with engines which have been certified as complying with 1980 Emission Standards. In either case, the maintenance schedules contained herein must be used to maintain your engine.



FIG. 1 Typical Vehicle Emission Control Information Decal

EMISSION SYSTEMS REQUIRED MAINTENANCE

Maintenance Schedule B

BRONCO — ALL U.S. VEHICLES WITH UNLEADED FUEL ENGINES

F-100/150 Except 4.9L (300 CID); F-250; F-150 4x4 4.9L (300 CID)

E-100/150/250 (Cont'd.)

(Except E-100/150 with 4.9L [300 CID] Engine)

MAINTENANCE SCHEDULE B MAINTENANCE OPERATION	SERVICE INTERVAL Time in months or miles (or kilometers) in thousands, whichever occurs first, unless otherwise specified. Note — Scheduled maintenance beyond 50,000 miles (80,000 km.) should be continued at the same intervals as before except as noted.						
	7.5	15	22.5	30	37.5	45	52.5
MONTHS	7.5	15	22.5	30	37.5	45	52.5
MILES	7.5	15	22.5	30	37.5	45	52.5
KILOMETERS	12	24	36	48	60	72	84
Emission Control Devices and Systems							
Change engine oil (3)(4)	B	B	B	B	B	B	B
Replace engine oil filter (3)(4)	B		B		B		B
Replace spark plugs (1)(4)				B			
Check coolant condition and protection (5)	ANNUALLY						
Replace coolant (6)(5)							B
Check cooling system hoses and clamps	ANNUALLY						
Check drive belt condition and tension (2)	B (8)			B			
Check idle speeds (adjust as required) (1)(2)	B (8)			B			
Check choke system				B			
Replace carburetor air cleaner element (7)				B			
Replace crankcase emission filter in air cleaner (7)	NOT REQUIRED						
V-8 engines				B			
4.9L (300 CID) 6 cyl.				B			
Check and lubricate exhaust heat control valve: 4.9L (300 CID) only				B			

NOTES:

- (1) Refer to the Vehicle Emission Control Information Decal for specification.
- (2) After 50,000 miles (80,000 km.), these services are required only to correct unusual engine operation.
- (3) **ENGINE OIL AND FILTER:** Change oil at 7,500 miles (12,000 kilometers) or 12 months, whichever occurs first. Replace oil filter at first oil change, followed by replacement at alternate oil changes. If vehicle mileage is less than 15,000 miles (24,000 kilometers) each 12 months, replace oil filter at every oil change.
- (4) **SEVERE SERVICE OPERATION: WHEN OPERATING YOUR VEHICLE UNDER ANY OF THE FOLLOWING CONDITIONS, CHANGE ENGINE OIL EVERY 3 MONTHS OR 3,000 MILES (4,800 KILOMETERS), WHICHEVER OCCURS FIRST, AND REPLACE OIL FILTER AT ALTERNATE OIL CHANGES. CHECK, CLEAN AND REGAP SPARK PLUGS EVERY 6,000 MILES (9,600 KILOMETERS).**
 - EXTENDED PERIODS OF IDLING OR LOW SPEED OPERATION SUCH AS DOOR-TO-DOOR DELIVERY.
 - TOWING TRAILERS OVER 2,000 LBS. (900 KG) GROSS LOADED WEIGHT FOR LONG DISTANCES.
 - OPERATION WHEN OUTSIDE TEMPERATURE REMAINS BELOW +10°F (−12°C) FOR 60 DAYS OR MORE AND MOST TRIPS ARE LESS THAN 10 MILES (16 KILOMETERS).
 - OPERATION IN SEVERE DUST CONDITIONS. (DOES NOT APPLY TO SPARK PLUG MAINTENANCE.)
 - EXTENDED PERIODS OF HIGH SPEED OPERATION WITH FULLY LOADED VEHICLE (MAX. GVW).
- (5) Coolant protection checks should be made just prior to the onset of freezing weather, where applicable. If coolant is dirty or rusty in appearance, the system should be drained, flushed and refilled with the prescribed solution of cooling system fluid and water. Use only a permanent type coolant that meets Ford Specification ESE-M97B18-C.
- (6) Replace every 3 years or at specified mileage, whichever occurs first.
- (7) **More often if operated in severe dust conditions.**
- (8) These initial break-in service intervals are not required after 50,000 miles (80,000 kilometers) — other standard maintenance interval items should be continued as previously specified.

INSPECT means a visual observation of a system.

CHECK means a functional measurement of a system's operation (performance) — correct as required.

EMISSION SYSTEMS REQUIRED MAINTENANCE**Maintenance Schedule B****F-100/150 4.9L (300 CID) Only Except F-150 4x4****E-100/150 4.9L (300 CID) Only**

MAINTENANCE SCHEDULE B MAINTENANCE OPERATION	SERVICE INTERVAL Time in months or miles (or kilometers) in thousands, whichever occurs first, unless otherwise specified. Note — Scheduled maintenance beyond 50,000 miles (80,000 km.) should be continued at the same intervals as before except as noted.					
	5	10	20	30	40	50
MONTHS						
MILES						
KILOMETERS						
Emission Control Devices and Systems						
Change engine oil (3)(4)		B	B	B	B	B
Replace engine oil filter (3)(4)		B	B	B	B	B
Replace spark plugs (1)(4)				B		
Check coolant condition and protection (5)	ANNUALLY					
Replace coolant (6)(5)						B
Check cooling system hoses and clamps	ANNUALLY					
Check drive belt condition and tension	B			B		
Check idle speeds (adjust as required) (1)(2)	B			B		
Check choke system				B		
Replace carburetor air cleaner element (7)				B		
Replace crankcase filter in air cleaner (7)				B		
Check and lubricate exhaust heat control valve				B		

NOTES:

- ① Refer to the Vehicle Emission Control Information Decal for specification.
- ② After 50,000 miles (80,000 km.), these services are required only to correct unusual engine operation.
- ③ Change engine oil and replace oil filter at 10,000 miles (16,000 kilometers) or 12 months, whichever occurs first.
- ④ **SEVERE SERVICE OPERATION: WHEN OPERATING YOUR VEHICLE UNDER ANY OF THE FOLLOWING CONDITIONS, CHANGE ENGINE OIL EVERY 3 MONTHS OR 3,000 MILES (4,800 KILOMETERS), WHICHEVER OCCURS FIRST, AND REPLACE OIL FILTER AT ALTERNATE OIL CHANGES. CHECK, CLEAN AND REGAP SPARK PLUGS EVERY 6,000 MILES (9,600 KILOMETERS).**
 - EXTENDED PERIODS OF IDLING OR LOW SPEED OPERATION SUCH AS DOOR-TO-DOOR DELIVERY.
 - TOWING TRAILERS OVER 2,000 LBS. (900 KG) GROSS LOADED WEIGHT FOR LONG DISTANCES.
 - OPERATION WHEN OUTSIDE TEMPERATURE REMAINS BELOW +10°F (-12°C) FOR 60 DAYS OR MORE AND MOST TRIPS ARE LESS THAN 10 MILES (16 KILOMETERS).
 - OPERATION IN SEVERE DUST CONDITIONS.
 - EXTENDED PERIODS OF HIGH SPEED OPERATION WITH FULLY LOADED VEHICLE (MAX. GVW).
- ⑤ Coolant protection checks should be made just prior to the onset of freezing weather, where applicable. If coolant is dirty or rusty in appearance, the system should be drained, flushed and refilled with the prescribed solution of cooling system fluid and water. Use only a permanent type coolant that meets Ford Specification ESE-M97B18-C.
- ⑥ Replace coolant every 3 years or at the specified mileage, whichever occurs first.
- ⑦ **More often if operated in severe dust conditions.**

INSPECT means a visual observation of a system.

CHECK means a functional measurement of a system's operation (performance) — correct as required.

EMISSION SYSTEMS REQUIRED MAINTENANCE**Maintenance Schedule E****BRONCO, ECONOLINE AND F-SERIES (LIGHT TRUCK)****Leaded Fuel Engines, Except 5.0L (302 CID) Canadian Vehicles**

MAINTENANCE OPERATION	SERVICE INTERVAL									
	Time in months or miles (or kilometers) in thousands, whichever occurs first, unless otherwise specified. Note — Scheduled maintenance beyond 50,000 miles (80,000 km) should be continued at the same intervals as before except as noted.									
MONTHS	5	10	15	20	25	30	35	40	45	50
MILES	5	10	15	20	25	30	35	40	45	50
KILOMETERS	8	16	24	32	40	48	56	64	72	80
Emission Control Devices and Systems										
Change engine oil (2)	E	E	E	E	E	E	E	E	E	E
Replace engine oil filter (2)	E	E	E	E	E	E	E	E	E	E
Check coolant condition and protection (3)	ANNUALLY									
Replace engine coolant (6)								E		
Check cooling system hoses and clamps	ANNUALLY									
Check drive belt condition and tension (7) (8)			E			E			E	
Replace crankcase emission filter (4)						E				
Replace or service carburetor air filter (4)						E				
Replace PCV valve						E				
Replace spark plugs (1) (2)			E			E			E	
Check choke system (1)			E			E			E	
Replace fuel system filter			E						E	
Check and apply lubricant to manifold heat control valve (if so equipped)						E				
Check engine idle speeds (curb, fast, TSP-off) (1)	E (5)		E			E			E	
Check throttle control system (1)	E (5)		E			E			E	
Check and lubricate exhaust heat control valve (6 cyl. only)						E				

NOTES:

- (1) Refer to the Engine Exhaust Emission Control Information Decal for specifications.
 - (2) **SEVERE SERVICE OPERATION: WHEN OPERATING YOUR VEHICLE UNDER ANY OF THE FOLLOWING CONDITIONS, CHANGE OIL EVERY 3 MONTHS OR 3,000 MILES (4,800 KILOMETERS), WHICHEVER OCCURS FIRST, AND REPLACE OIL FILTER AT ALTERNATE OIL CHANGES. CLEAN, CHECK AND REGAP SPARK PLUGS EVERY 6,000 MILES (9,600 KILOMETERS).**
 - EXTENDED PERIOD OF IDLING OR LOW SPEED OPERATION SUCH AS DOOR-TO-DOOR DELIVERY.
 - TOWING TRAILERS OVER 2,000 LBS. GROSS LOADED WEIGHT FOR LONG DISTANCES.
 - OPERATION WHEN OUTSIDE TEMPERATURE REMAINS BELOW +10°F (-12°C) FOR 60 DAYS OR MORE AND MOST TRIPS ARE LESS THAN 10 MILES (16 KILOMETERS).
 - OPERATION IN SEVERE DUST CONDITIONS. (DOES NOT APPLY TO SPARK PLUG MAINTENANCE.)
 - EXTENDED PERIODS OF HIGH SPEED OPERATION WITH FULLY LOADED VEHICLE (MAXIMUM G.V.W.).
 - (3) Coolant protection checks should be made just prior to the onset of freezing weather, where applicable. If coolant is dirty or rusty in appearance, the system should be drained, flushed, and refilled with the prescribed solution of cooling system fluid and water. Use only a permanent type coolant that meets Ford specification ESE-M97B18-C.
 - (4) More often if operated in severe dust conditions.
 - (5) These initial break-in service intervals are not required after 50,000 miles (80,000 kilometers) — other standard maintenance interval items should be continued as previously specified.
 - (6) Replace coolant every three years or 40,000 miles (64,000 kilometers), whichever occurs first.
 - (7) Adjust, service, or replace as required.
 - (8) Also a noise emission control service (E-350 and F-350 over 10,000# GVWR only).
- INSPECT means a visual observation of a system.
- CHECK means a functional measurement of a system's operation (performance) — correct as required.

EMISSION SYSTEMS REQUIRED MAINTENANCE

Maintenance Schedule L

BRONCO, ECONOLINE AND F-SERIES (LIGHT TRUCK)

(Canadian Leaded Fuel Vehicles With 5.0L [302 CID] Engines Only)

MAINTENANCE OPERATION	SERVICE INTERVAL									
	Time in months or miles (or kilometers) in thousands, whichever occurs first, unless otherwise specified. Note — Scheduled maintenance beyond 50,000 miles (80,000 km) should be continued at the same intervals as before except as noted.									
MONTHS	6	12	15	18	24	30	36	42	45	48
MILES	6	12	15	18	24	30	36	42	45	48
KILOMETERS	9.6	19.2	24	28.8	38.4	48	57.6	67.2	72	76.8
Emission Control Devices and Systems										
Change engine oil (3)(4)	L	L		L	L	L	L	L		L
Replace engine oil filter (3)(4)	L			L		L		L		
Replace spark plugs (1)(4)			L			L			L	
Lubricate and check exhaust control valve (if so equipped)			L			L			L	
Check coolant condition and protection (5)	ANNUALLY									
Check cooling system hoses and clamps	ANNUALLY									
Replace coolant (6)								L		
Check drive belt condition and tension			L			L			L	
Replace PCV valve						L				
Check fast idle speed (adjust as required) (8)	L					L				
Check curb idle speed (adjust as required) (1)	L		L			L			L	
Check TSP off-speed (adjust as required) (1)(2)	L									
Check choke system throttle and choke linkage and air valve			L			L			L	
Replace carburetor air cleaner element (7)						L				
Replace crankcase filter in air cleaner (7)						L				
Check air cleaner temperature control			L			L			L	
Check Thermactor system			L			L			L	
Inspect fuel vapor system						L				
Check ignition initial timing (adjust as required) (1)(2)	L									
Check/adjust decel throttle control system	L		L			L			L	
Clean crankcase breather cap (7)			L			L			L	
Check and clean EGR System			L			L			L	
Check PCV system, hoses and tubes			L						L	
Clean PCV system, hoses and tubes						L				

NOTES:

- (1) Refer to the Vehicle Emission Control Information Decal for specifications.
- (2) After 50,000 miles (80,000 km), these services are required only to correct unusual engine operation.
- (3) Change engine oil every 6,000 miles (9,600 kilometers) or six months, whichever occurs first. Replace the oil filter at the first oil change and then at alternate oil changes thereafter.
- (4) **SEVERE SERVICE OPERATION: WHEN OPERATING YOUR VEHICLE UNDER ANY OF THE FOLLOWING CONDITIONS, CHANGE ENGINE OIL EVERY 3 MONTHS OR 3,000 MILES (4,800 KILOMETERS), WHICHEVER OCCURS FIRST, AND REPLACE OIL FILTER AT ALTERNATE OIL CHANGES. CHECK, CLEAN AND REGAP SPARK PLUGS EVERY 6,000 MILES (9,600 KILOMETERS).**
 - EXTENDED PERIODS OF IDLING OR LOW SPEED OPERATION SUCH AS DOOR-TO-DOOR DELIVERY.
 - TOWING TRAILERS OVER 2,000 LBS. (900 KG) GROSS LOADED WEIGHT FOR LONG DISTANCES.
 - OPERATION WHEN OUTSIDE TEMPERATURE REMAINS BELOW +10°F (-12°C) FOR 60 DAYS OR MORE AND MOST TRIPS ARE LESS THAN 10 MILES (16 KILOMETERS).
 - OPERATION IN SEVERE DUST CONDITIONS.
 - EXTENDED PERIODS OF HIGH SPEED OPERATION WITH FULLY LOADED VEHICLE (MAX. GVW).
- (5) Coolant protection checks should be made just prior to the onset of freezing weather, where applicable. If coolant is dirty or rusty in appearance, the system should be drained, cleaned, and refilled with the prescribed solution of cooling system fluid and water. Use only a permanent type coolant that meets Ford specification ESE-M97B18-C.
- (6) Replace every 3 years or at the specified mileage, whichever occurs first.
- (7) More often if operated in severe dust conditions.
- (8) These initial break-in service intervals are not required after 50,000 miles (80,000 kilometers) — other standard maintenance interval items should be continued as previously specified.

INSPECT means a visual observation of a system.

CHECK means a functional measurement of a system's operation (performance) — correct as required.

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EMISSION SYSTEMS REQUIRED MAINTENANCE**Maintenance Schedule E****600-700 AND 7000 SERIES AND 800-900, 8000-9000 SERIES TRUCKS**

FOR ENGINE SIZES 6.1L (370 CID), 6.6L (400 CID), 7.0L (429 CID), MAINTENANCE OPERATION	SERVICE INTERVAL Time in months or miles (or kilometers) in thousands, whichever occurs first, unless otherwise specified. Note — Scheduled maintenance beyond 50,000 miles (80,000 km) should be continued at the same intervals as before except as noted.									
	5	10	15	20	25	30	35	40	45	50
	5	10	15	20	25	30	35	40	45	50
	8	16	24	32	40	48	56	64	72	80
Emission Control Devices and Systems										
Change engine oil ②	E	E	E	E	E	E	E	E	E	E
Replace engine oil filter	E	E	E	E	E	E	E	E	E	E
Check coolant condition and protection ③	ANNUALLY									
Replace engine coolant ⑦								E		
Check cooling system hoses and clamps	ANNUALLY									
Check drive belts condition and tension			E			E			E	
Replace crankcase emission filter ④						E				
Replace or service carburetor air filter ④ ⑤ ⑧						E				
Replace PCV valve						E				
Replace spark plugs ① ②			E			E			E	
Check choke system			E			E			E	
Replace fuel system filter			E						E	
Check and lubricate manifold heat control valve (if so equipped)						E				
Check engine idle speed (adjust as required) ①	E ⑥		E			E			E	
Check throttle control system ①	E ⑥		E			E			E	

NOTES:

① Refer to the Vehicle Emission Control Information Decal for specifications.

② **SEVERE SERVICE OPERATION: WHEN OPERATING YOUR VEHICLE UNDER ANY OF THE FOLLOWING CONDITIONS, CHANGE ENGINE OIL EVERY 3 MONTHS OR 3,000 MILES (4,800 KILOMETERS), WHICHEVER OCCURS FIRST, AND REPLACE OIL FILTER AT ALTERNATE OIL CHANGES. CHECK, CLEAN AND REGAP SPARK PLUGS EVERY 6,000 MILES (9,600 KILOMETERS).**

- EXTENDED PERIODS OF IDLING OR LOW SPEED OPERATION SUCH AS DOOR-TO-DOOR DELIVERY.
- OPERATION WHEN OUTSIDE TEMPERATURE REMAINS BELOW +10°F (-12°C) FOR 60 DAYS OR MORE AND MOST TRIPS ARE LESS THAN 10 MILES (16 KILOMETERS).
- OPERATION IN SEVERE DUST CONDITIONS.
- EXTENDED PERIODS OF HIGH SPEED OPERATION WITH FULLY LOADED VEHICLE (MAX. GVW).

③ Coolant protection checks should be made just prior to the onset of freezing weather, where applicable. If coolant is dirty or rusty in appearance, the system should be drained, flushed and refilled with the prescribed solution of cooling system fluid and water. Use only a permanent type coolant that meets Ford Specification ESE-M97B18-C.

④ **More often if operated in severe dust conditions.**

⑤ Optional oil bath carburetor air cleaner — clean and change oil every 5,000 miles (8,000 kilometers).

⑥ These initial break-in service intervals are not required after 50,000 miles (80,000 kilometers) — other standard maintenance interval items should be continued as previously specified.

⑦ Replace coolant every 3 years or 40,000 miles (64,000 kilometers) whichever occurs first.

⑧ Check restriction indicator daily (if so equipped), clean or replace element when indicator shows red.

INSPECT means a visual observation of a system.

CHECK means a functional measurement of a system's operation (performance) — correct as required.

EMISSION SYSTEMS REQUIRED MAINTENANCE**Maintenance Schedule P
800-900, 8000-9000 SERIES**

FOR ENGINE SIZE 7.8L (477 CID), 8.8L (534 CID)	SERVICE INTERVAL Time in months or miles (or kilometers) in thousands, whichever occurs first, unless otherwise specified. Note — Scheduled maintenance beyond 50,000 miles (80,000 km) should be continued at the same intervals as before except as noted.											
	4	8	12	16	20	24	28	32	36	40	44	48
MONTHS	4	8	12	16	20	24	28	32	36	40	44	48
MILES	4	8	12	16	20	24	28	32	36	40	44	48
KILOMETERS	6.4	12.8	19.2	25.6	32.0	38.4	44.8	51.2	57.6	64.0	70.4	76.8
Emission Control Devices and Systems												
Change engine oil ①	P	P	P	P	P	P	P	P	P	P	P	P
Replace engine oil filter ①	P	P	P	P	P	P	P	P	P	P	P	P
Replace engine coolant ①										P		
Inspect coolant level	DAILY											
Check engine cooling system hoses, clamps and protection ②	TWICE ANNUALLY											
Check drive belts condition and tension				P				P				P
Clean crankcase breather cap						P						
Replace carburetor air filter (without restriction indicator)								P				
Clean and change oil carburetor oil bath air cleaner	P	P	P	P	P	P	P	P	P	P	P	P
Check carburetor air filter (with restriction indicator) ③	DAILY											
Check air cleaner temperature control/delay valve (if so equipped)				P				P				P
Check and clean PCV system, hoses and tubes				P				P				P
Replace spark plugs* ①				P				P				P
Check choke/throttle system				P				P				P
Adjust engine valve clearance				P				P				P
Replace fuel filter system (chassis mounting and cartridge)						P						P
Drain fuel filter system (chassis mounted)			P						P			
Lubricate distributor shaft bushing				P				P				P
Check spark control system/ delay valve				P				P				P
Check Thermactor system				P				P				P
Check engine idle speeds (curb, fast)*	P ⁴			P				P				P
Check decel throttle control system	P ⁴			P				P				P

NOTES:

*Refer to the Vehicle Emission Control Information Label for specification.

- ① **SEVERE SERVICE OPERATION: WHEN OPERATING YOUR VEHICLE UNDER ANY OF THE FOLLOWING CONDITIONS, CHANGE ENGINE OIL EVERY 3 MONTHS OR 3,000 MILES (4,800 KILOMETERS), WHICHEVER OCCURS FIRST, AND REPLACE OIL FILTER AT ALTERNATE OIL CHANGES. CLEAN, CHECK AND REGAP SPARK PLUGS EVERY 6,000 MILES (9,600 KILOMETERS).**
- **EXTENDED PERIODS OF IDLING OR LOW SPEED OPERATION SUCH AS DOOR-TO-DOOR DELIVERY.**
 - **OPERATION WHEN OUTSIDE TEMPERATURE REMAINS BELOW +10°F (-12°C) FOR 60 DAYS OR MORE AND MOST TRIPS ARE LESS THAN 10 MILES (16 KILOMETERS).**
 - **OPERATION IN SEVERE DUST CONDITIONS.**
 - **EXTENDED PERIODS OF HIGH SPEED OPERATION WITH FULLY LOADED VEHICLE (MAX. GVW).**
- ② Coolant protection checks should be made just prior to the onset of freezing weather, where applicable. If coolant is dirty or rusty in appearance, the system should be drained, flushed and refilled with the prescribed solution of cooling system fluid and water. Use only a permanent type coolant that meets Ford Specification ESE-M97B18-C.
- ③ Replace coolant every 3 years or 40,000 miles (64,000 kilometers), whichever occurs first.
- ④ These initial break-in service intervals are not required after 50,000 miles (80,000 kilometers) — other standard maintenance interval items should be continued as previously specified.
- ⑤ Check restriction indicator daily. Clean or replace element when indicator shows red.

INSPECT means a visual observation of a system.

CHECK means a functional measurement of a system's operation (performance) — correct as required.

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REQUIRED MAINTENANCE SERVICE PROCEDURES

A-ENGINE MECHANICAL SUBSYSTEMS

A-1: ENGINE OIL CHANGE WITH OR WITHOUT OIL FILTER CHANGE

ENGINE OIL DRAIN

1. Apply parking brake and block wheels.
2. Bring engine to normal operating temperature and turn off.
3. Remove oil drain plug and drain engine oil.
4. Clean oil drain plug and inspect gasket. Replace gasket if damaged.
5. Verify that gasket is properly located. Correct as required.
6. Reinstall oil drain plug and tighten to specification.

NOTE: If the oil filter is not to be changed, remove the oil filler cap and fill the crankcase with the specified amount, type and grade of oil.

Reinstall the oil filler cap; start the engine and inspect for oil leak(s). Correct as required.

ENGINE OIL FILTER CHANGE

A. Disposable type oil filter change:

1. Remove oil filter and discard.
2. Clean the gasket sealing surface at the cylinder block or adapter.
3. Coat the gasket on the filter with a light film of oil; screw the filter onto the adapter or cylinder block, until the gasket contacts the sealing surface; then, advance it an additional 1/2 turn.

B. Replaceable element type oil filter change:

1. Place a drip pan under the filter. Remove the filter center bolt; then, remove the filter assembly and gasket. Discard the gasket.
2. Remove the filter element, neoprene gasket, spring and seat; then remove the center bolt from the container and the fiber gasket from the bolt.
3. Wash all parts in solvent. Make sure the openings in the bolt are clean.
4. Install the new filter element in the housing, following the instructions furnished with the new element.
5. Clean the cylinder block filter recess. Install a new gasket.
6. Place the filter assembly in position and thread the center bolt into the adapter, finger tight.
7. Rotate the filter assembly slightly, in each direction, to make sure the gasket is seated evenly.
8. Tighten the filter center bolt to specification.

CAUTION: Make sure not to over-tighten the center bolt.

Remove the oil filler cap and fill the crankcase with the specified amount, type and grade of oil. (Fig. 2).

Re-install the oil filler cap; start the engine and inspect for oil leak(s). Correct as required.

A-2: VALVE CLEARANCE—ADJUST

APPLICATION: HEAVY DUTY TRUCKS—7.8L (477 CID) V-8 AND 8.8L (534 CID) V-8 ENGINES ONLY

1. Block wheels and apply parking brake.
2. Bring engine to normal operating temperature and turn off.
3. Disconnect the crankcase ventilation closure hose and carbon canister hose from the air cleaner.
4. Remove the air cleaner assembly.
5. Remove the two crankcase ventilation hoses from the rocker arm covers.
6. Disconnect the spark plug wire from the spark plugs and remove the wires from the retainers. Move the wires out of the way.
7. Remove the attaching screws from the rocker arm covers.
8. Remove the rocker arm covers then torque the rocker arm support bolts to specification.
9. Rotate the crankshaft until No. 1 piston is on TDC at the end of compression stroke.
10. Loosen the locknut and set the valve clearance to specification (intake, 0.019-0.021 in.; exhaust, 0.019-0.021 in.) with a suitable feeler gauge (go-no-go type). After adjusting each valve, torque the locknut to specification and recheck the valve clearance.
11. Adjust the valves in the remaining cylinders in the same manner as No. 1 piston and following the firing order sequence. This can be accomplished by rotating the engine in increments of 1/4 revolution (90 degrees). After two complete revolutions, all the cylinders will have been at their TDC position at the top of the compression stroke.
12. Clean all gasket material from the cylinder heads and rocker arm covers.
13. Install new gaskets on the rocker arm covers.
14. Reinstall rocker arm covers on the cylinder heads and loosely install the attaching screws.
15. Alternately torque the screws to specification.
16. Install the spark plug wires in the retainers and on the spark plugs.
17. Connect the crankcase ventilation hoses to the rocker arm covers.
18. Install the air cleaner assembly. Torque the air cleaner wing nut to specification.
19. Connect the crankcase ventilation closure hose and carbon canister to the air cleaner assembly.
20. Start the engine and check for leaks.

A-3: EXHAUST HEAT CONTROL VALVE—BIMETAL TYPE

APPLICATION: 4.9L (300 CID)

1. Inspect valve assembly for any abnormal condition. Repair or replace as necessary.

Engine Displacement	APPROXIMATE ENGINE OIL CAPACITY					
	U.S. Quarts With Filter Change	U.S. Quarts Without Filter Change	Imp. Quarts With Filter Change	Imp. Quarts Without Filter Change	Litres With Filter Change	Litres Without Filter Change
4.9L (300 CID) I-6	6	5	5	4.1	5.6	4.7
5.0L (302 CID) V-8	6	5	5	4.1	5.6	4.7
5.8L (351 CID) W-V-8	6	5	5	4.1	5.6	4.7
5.8L (351 CID) M-V-8	6	5	5	4.1	5.6	4.7
6.1L (370 CID)	9	8	7.5	6.6	8.5	7.6
6.6L (400 CID) V-8	6	5	5	4.1	5.6	4.7
7.0L (429 CID) V-8	9	8	7.5	6.6	8.8	7.6
7.5L (460 CID) V-8	6	5	5	4.1	5.6	4.7
7.8L (477 CID) V-8	10	9	8.3	7.5	9.5	8.5
8.8L (534 CID) V-8						

CA1415-2E

FIG. 2 Engine Oil Capacities

- Check valve and thermostatic spring operation by manually rotating the valve shaft. Valve must be free and return to the closed position when cold (Rotunda choke tester or equivalent may be used if necessary to cool bimetal spring). If valve cannot be freed or closed, valve must be replaced.
- Lubricate the valve with COAZ-19A501-A or C4AZ-19A501-A graphite lube or equivalent.

A-4: COOLANT CONDITION AND PROTECTION

COOLING SYSTEM HOSE CHECK

Bring the engine to normal operating temperature and turn the engine off. With cooling system under pressure, inspect cooling system hoses and clamped hose connections for leaks, excessive deterioration, or contact wear. Inspect radiator assembly retention. Correct as necessary.

- Coolant Check—Remove radiator cap as follows:
 - NEVER** remove the radiator cap under any conditions while the engine is operating. Failure to follow these instructions could result in personal injury and/or damage to the cooling system or engine.
 - To avoid burns from scalding coolant or steam, use extreme care when removing the radiator cap. Switch the engine off and wait until it is cooled. Then, if the radiator is still hot, carefully wrap a thick cloth around the cap and rotate slowly to the first stop. Step back until the pressure is released, then press down on the cap and rotate the cap until free. Remove the cap.
- Check coolant for dirty or rusty appearance. Dirty or rusty coolant requires replacement to protect the cooling system from corrosion damage. Replace the coolant according to the procedures given under A-5 (Coolant Replacement).

NOTE: If the coolant is to be replaced, the remainder of this procedure may be omitted.

- If coolant condition is satisfactory, check coolant concentration for proper protection level. Use a Rotunda Optical type tester or a Hydrometer for testing. Maintain a protection level of at least -20 Degrees F (-30 Degrees C) to preserve anti-rust corrosion protection and assure proper engine

operating temperature. If concentration level is low, open the radiator petcock, partially drain the radiator, and add 100 percent concentration of Ford Cooling System Fluid, or equivalent to obtain the recommended protection level.

COOLANT SPECIFICATION —Use only a permanent-type coolant that meets Ford Specification ESE-M97B18-C or equivalent. Do not use alcohol or methanol anti-freeze or mix them with the specified coolant.

- Coolant level should be maintained as follows:
 - Standard Cooling System and Expansion Bottle System**
 - Check coolant level and if required, fill with recommended coolant mixture to approximately 3/4 to 1-1/2 inches below the filler neck seat on a downflow radiator (vertical tubes) or to approximately 2-1/2 to 4.0 inches below the filler neck seat on a crossflow radiator (horizontal tubes).
 - Expansion bottle should be empty or nearly empty during normal operation.
 - Reinstall radiator cap.

A-5: COOLING SYSTEM CHECK AND COOLANT REPLACEMENT

COOLING SYSTEM HOSE CHECK

Bring the engine to normal operating temperature and turn the engine off. With cooling system under pressure, inspect cooling system hoses and clamped hose connections for leaks, excessive deterioration, or contact wear. Inspect radiator installation retention. Note any discrepancies and proceed to "Drain coolant as follows" below.

Drain coolant as follows:

- NEVER** remove the radiator cap under any conditions while the engine is operating. Failure to follow these instructions could result in personal injury and/or damage to the cooling system or engine.
- To avoid burns from scalding coolant or steam, use extreme care when removing the radiator cap. Switch the engine off and wait until cool, then if radiator is still hot, carefully wrap a thick cloth around the cap and rotate slowly to the first stop.

Step back until the pressure is released then press down on the cap and rotate until free. Remove the cap.

3. Place the heater temperature control at the maximum heat position.
4. Open radiator petcock and remove the cylinder block drain plug(s) to drain the coolant system.
5. Correct/Repair/Replace any components as required from the "Cooling System Hose Check" above.

Clean Engine Cooling System as follows:

Flush with clear water and if excessively dirty or rusty, the use of Ford radiator flush and/or reverse pressure flushing is recommended. Drain and flush reservoir expansion bottle systems if so equipped.

Refill Engine Cooling System as follows:

1. Close radiator petcock and install cylinder block drain plug(s).
2. When refilling the cooling system, use equal parts of water and coolant as follows:

NOTE: Coolant Specification —Use only a permanent-type coolant that meets Ford Specification ESE-M97B18-C or equivalent. Do not use alcohol or methanol anti-freeze or mix them with the specified coolant.

Freeze protection may also be checked by using either a Rotunda optical anti-freeze/battery tester or a Hydrometer. A 50/50 mix of coolant concentrate and water will provide approximately -35 degrees protection, and afford necessary anticorrosion protection.

Refill the radiator to approximately 2-1/2 inches below the filler neck seat on a cross-flow radiator (horizontal tubes) and to approximately 3/4 inch below the filler neck seat on a down-flow radiator (vertical tubes) with the recommended coolant mixture.

3. Operate engine until thermostat opens and the radiator upper hose becomes hot.
4. Stop the engine and add coolant to approximately 1-1/2 inches below the filler neck seat on a cross-flow radiator, and to approximately 1/4 inch below the filler neck seat on a down-flow radiator. Do not add coolant to expansion bottle (no filler neck) if so equipped.
5. Reinstall radiator cap.

A-6: DRIVE BELT CONDITION AND TENSION

NOTE: Due to space limitations, it may be necessary to remove components to gain access for inspecting, checking, or replacing accessory drive belts.

If the engine is equipped with a "Dura Spark" ignition system and any high tension ignition wire was detached from a spark plug, the distributor cap, or the coil to perform this maintenance operation, silicone grease (Ford No. D7AE-19A331-AA or equivalent) must be applied to the boot before reconnection. Using a small clean screwdriver, apply a thin layer of silicone grease on the entire interior surface of the boot.

1. Apply the parking brake and block the wheels.

2. Inspect all accessory drive belts for excessive wear, cracks, glazed condition, and frayed or broken cords. Replace any drive belt exhibiting these conditions and adjust to new belt tension specification (Fig. 3).

CAUTION: On dual belt accessory drive the belts must be replaced in matched sets.

3. Bring the engine to normal operating temperature and turn the engine off. Using the Rotunda belt tension gauge (Models 210019 and 210020) or equivalent, check the tension of all drive belts (Fig. 3); on dual drive belts, check only one belt. Compare measured tension to specification.

NOTE: A belt tension gauge offers the most accurate means of checking belt tension. Accordingly, a belt tension gauge should be used whenever possible; removal of fan shroud, air induction hardware, etc., may be necessary. If space limitations, however, make it absolutely impossible to use a tension gauge, the following procedure may be substituted:

- a. Press firmly on the belt (approximately at the middle of the free span between pulleys).
- b. Belt deflection should be as follows:
 - For all belts with a free span less than 12", deflection should be between 1/8" and 1/4".
 - For all belts with a free span greater than 12", deflection should be between 1/8" and 3/8".

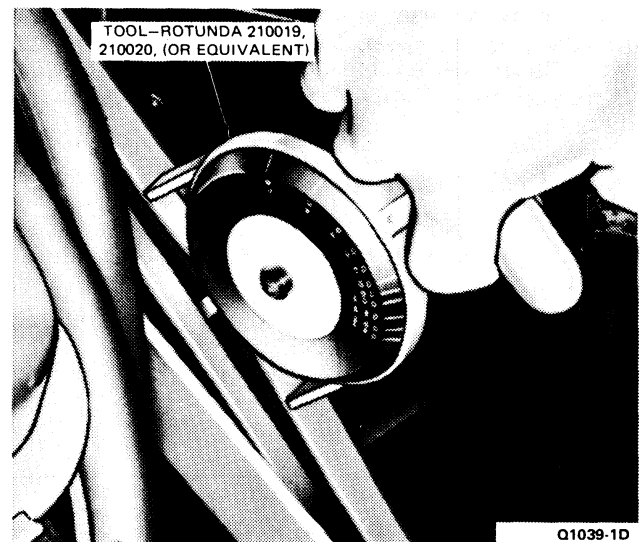


FIG. 3 Checking Belt Tension

4. If any belt is not to tension specification, adjust the drive belt as follows:
 - a. Loosen the accessory pivot bolt and/or adjustment slot fastener(s).
 - b. If accessible, install a belt tension gauge on the drive belt.
 - c. Without damaging the accessory move the accessory toward or away from the engine until the correct belt tension specification is registered.

NOTE: New and used belt tension specifications differ when using the belt tension gauge. Refer to belt tension specifications.

When using the deflection method, use the deflection specifications in Step 3b. above.

- d. Tighten the accessory adjustment slot fastener(s) to the specified torque(s).
- e. Tighten the accessory pivot bolt to the specified torque.
- f. Recheck belt tension. Repeat adjustment process if necessary.

NEW AND USED DRIVE BELT TENSION SPECIFICATIONS

1. All 1/4" wide drive belts that are **newly installed** should read 50-80 lbs. Newly installed means installation of the drive belt before the engine has made no more than one rotation and the belt has had a chance to stretch or seat into the pulley grooves.
2. All 1/4" wide belts **with more than ten (10) minutes of engine operation** on them should read between 40-60 lbs. If a belt tension is not within the specified tension range, re-adjust the belt tension to 40-60 lbs.
3. All 3/8", 15/32", 1/2", and 5/8" wide drive belts that are **newly installed** should read 120-160 lbs. Newly installed means installation of the drive belt before the engine has made no more than one rotation and the belt has had a chance to stretch or seat into the pulley grooves.
4. All 3/8", 15/32", 1/2", and 5/8" wide drive belts **with more than ten (10) minutes of engine operation** on them, should read between 75-120 lbs. If a belt tension is not within the specified tension range, re-adjust the belt tension to 90-120 lbs.

FASTER TORQUE SPECIFICATIONS

The following is a list of fastener torque values for attachment of alternators, air pumps and related components.

1. Alternator and air pump to adjusting arm (thru slot): 24-40 ft-lb.
2. Alternator pivot bolt: 45-57 ft-lb.

3. Air pump pivot bolt: 22-32 ft-lb.
4. Tighten mount bracket fasteners to the specifications shown in Fig. 4.
5. Tighten flange bolts with serrations under the head of the bolt (spin-lock type) to the specifications shown in Fig. 5.

Size	Grade ①	Torque
1/4" — 20	5	70-105 in-lb
1/4" — 20	8	105-155 in-lb
5/16" — 18	5	12-18 ft-lb
5/16" — 18	8	17-25 ft-lb
3/8" — 16	5	22-32 ft-lb
3/8" — 16	8	30-45 ft-lb
7/16" — 14	5	40-55 ft-lb
7/16" — 14	8	50-70 ft-lb
M 8	5	14-21 ft-lb
M 8	8	20-28 ft-lb
M 10	5	28-40 ft-lb
M 10	8	40-57 ft-lb

① Identification of grades 5 and 8



Grade 5

Grade 8

CA4375-1A1

FIG. 4 Standard Screw and Washer Assembly, Bolts and Nuts Torque Specifications

Size	Grade ①	Torque
1/4" — 20	5	80-115 in-lb
5/16" — 18	5	16-22 ft-lb
3/8" — 16	5	27-37 ft-lb
7/16" — 14	5	45-60 ft-lb
M 8	5	18-25 ft-lb
M 10	5	32-44 ft-lb

① Identification of grades 5 and 8



Grade 5

Grade 8

CA4375-1A2

FIG. 5 Flange Bolts with Serrations Under Head of Bolt (spin-lock type) Torque Specifications

B. EMISSION SUBSYSTEMS

B-1: PCV VALVE REPLACEMENT

1. Disconnect hose(s) and remove PCV Valve.

NOTE: If a high flow PCV Valve is scheduled for installation, consult the Vehicle Emission Control Information Decal for the correct high flow PCV Valve part number.

If replacement PCV Valve requires a plastic fitting for additional vacuum lines, soak the new plastic fitting (furnished in PCV Valve Replacement Kit), in hot water prior to installing on new PCV Valve. Proceed to Step 2.

2. Install new PCV Valve and connect hose(s).
3. Check curb idle speed in accordance with Procedure "D-2. Engine Idle Speeds" in this Part.

B-2: PVC SYSTEM, HOSES AND TUBES—CHECK

A. WITH THE ENGINE IDLING:

1. Remove the fresh air inlet hose of the PCV system from the rocker arm cover (located on the side/end of engine opposite to the PCV valve).
2. Hold Ford PCV valve tester or equivalent over the opening in the valve cover, making sure there is a positive seat between the tester and cover.
3. Start the engine and allow it to operate at the idle speed.
4. If the ball settles in the good (green) area, the system is functioning properly. If the ball settles

in the repair (red) area, servicing of the system is needed.

NOTE: If the No. V-44 PCV tester is not applicable, use alternate method shown under B-2 below.

B. WITH VEHICLE AT NORMAL OPERATING TEMPERATURE:

1. Remove the PCV valve from its mounting. If the valve is functioning properly and not plugged, a hissing air noise will be heard as the air passes through the valve, and a strong vacuum should be felt when a finger is placed over the valve inlet. While finger is over the valve inlet, check for vacuum leaks in the hose line and at all connections.
2. Reinstall the PCV valve, then remove the crankcase air inlet hose at the air cleaner connection. Loosely hold a small piece of stiff paper (such as a 3x5 inch memo card or parts tag card) over the opening at the end of the inlet hose. The paper should be sucked against the hose opening with a noticeable force **after** sufficient time has elapsed for the crankcase pressure to lower (usually about one minute or more).

NOTE: When performing this test on vehicles equipped with a front fill oil pipe, it is necessary to remove the oil fill pipe cap and tape or plug the opening air tight prior to performing this test.

C. WITH THE ENGINE STOPPED:

1. Remove the PCV valve from its mounting and shake it. A metallic clicking noise should be heard, indicating the valve is free.
2. If the PCV system meets the requirements of tests A or B, the system is functioning satisfactory and no further service is required. If it fails either of the tests, replace the PCV valve and repeat tests A or B. If the PCV system still fails test A or B, clean the PCV system, hoses and tubes in accordance with the procedures under "B-3 Clean PCV System Hoses and Tubes".

B-3: PCV SYSTEM, HOSES AND TUBES—CLEAN

1. Remove the PCV system components, filler cap, PCV valve, hoses, tubes, fittings, etc. from the engine.
2. Clean the rubber ventilation hose(s) by passing a suitable cleaning brush through each of them.
3. Thoroughly wash the rubber hoses in a low volatility petroleum base solvent and dry with compressed air.
4. Thoroughly wash the crankcase breather cap, if so equipped, in a low volatility petroleum base solvent and shake dry. Refer to the procedures under "B-4 Crankcase Breather Cap—Clean".
5. Thoroughly clean tubes, fittings and connections to assure unobstructed flow of emission gases.
6. Install the PCV valve and reinstall previously removed hoses, tubes, fittings, etc. to their proper location.

7. Replace any system component that shows signs of damage, wear or deterioration as required (particularly rubber hoses that no longer fit snugly onto fittings).
8. Replace any hose or tube that cannot be cleaned satisfactorily.

B-4: CRANKCASE BREATHER CAP—CLEAN

1. Remove breather cap (oil filler) from rocker arm cover.
2. Remove cap from connecting hose.
3. Wash cap in a low volatility—petroleum base solvent.
4. Shake dry; do not dry with compressed air.
5. Check cap for cracks and/or physical damage—replace if necessary.
6. Reinstall breather cap to rocker arm cover and attach connecting hose.

B-5: THERMACTOR SYSTEM CHECK

AIR PUMP SUPPLY TEST

1. Remove air cleaner.
 2. Inspect all hoses and hose connections in the system for any abnormal conditions and correct or replace as necessary.
 3. Check the air pump belt tension and adjust to specifications, if required.
 4. With the transmission in Neutral or Park, and the parking brake on, warm the engine to normal operating temperature.
 5. Stop the engine and disconnect the air supply hose(s) from the air pump to the air by-pass valve at the air by-pass valve.
- If installation is a side or cover mounted by-pass valve, remove the by-pass valve from the pump.
6. Insert the air pump supply tester (Rotunda Tool #T75L-9486-A or equivalent), in the end of the hose disconnected from the by-pass valve. Clamp the hose securely to the thermactor pump pressure gauge to prevent it from blowing out.

For side or cover mounted by-pass valves, install an elbow and hose adapter and insert the Rotunda Tool #T75L-9486-a or equivalent.

CAUTION: Position the thermactor pump pressure gauge so that the air blast emitted will be harmlessly dissipated.

7. Connect a tachometer to the engine and start the engine.
- CAUTION: For the breakerless ignition system, use a tachometer rated for that type of ignition system.**

8. Start the engine and slowly increase engine speed to 1000 RPM and observe the pressure produced at the pressure gauge. The air pressure must be 2.25 (2-1/4) psi minimum.

If the Rotunda tool or an equivalent is not available, increase the engine speed to 1500 RPM, place hand over the open hose. Air flow should be heard and felt.

9. If air flow does not comply with minimum requirements listed in Step 8, install a new air pump and repeat 8.
10. Turn off the engine. Remove all test equipment, reinstall air pump mounted air by-pass valve (if removed), torque mounting bolts to specification. Reconnect the air supply hose(s) to the air by-pass valve and tighten the hose clamps. Tighten the air cleaner nut to specifications if the air cleaner was removed.

AIR BY-PASS VALVES

A. Normally Closed By-Pass Valve Functional Tests

NOTE: This type has only one vacuum connection.

1. If necessary, warm the engine to normal operating temperature with the transmission in Neutral or Park and the parking brake "ON".
2. Stop the engine and remove the air by-pass valve to air manifold check valve hoses at the by-pass valve. For a "tee" system, remove both hoses connecting the by-pass valve to the check valves. Install a tachometer.
CAUTION: For the breakerless ignition system, use a tachometer rated for that type of ignition system.
3. With the transmission in Neutral or Park and the parking brake "ON", start the engine. Accelerate the engine to 1500 RPM. Verify that air is flowing from the air by-pass valve hose connection(s) by placing hand over valve connection. Air flow should be heard and felt.
4. Remove the vacuum hose from the by-pass valve and plug off the vacuum hose. With the engine at 1500 RPM and hand held over the by-pass valve connection, there should be virtually no air flow felt or heard. Air flow will be discharged through the exhaust ports in the end of the valve silencer cover. If air flow is felt or heard through the by-pass valve connection, the valve is defective—replace the valve.
5. Stop the engine. Remove the plug from the vacuum hose.
6. Re-install the vacuum hose on the by-pass valve sense vacuum nipple.
7. If available, install the air pump supply tester (Rotunda Tool #75L-9486-A, or equivalent) to the air by-pass valve outlet using a short length of appropriate diameter hose. If the air by-pass valve has two outlet(s), plug the one without the tester. Start the engine and increase engine speed to 1000 RPM. Observe the pressure produced at the test gauge. The air pressure must be 2.25 (2-1/4) psi minimum. If the air pressure is not within specification, replace the valve.
8. Turn off the engine, remove all test equipment and connect the air supply hose(s) to the air by-pass valve and tighten all hose clamps(s).

B. Timed By-Pass Valve With Vacuum Vent

NOTE: This type has two vacuum connections—sense vacuum (closest nipple to by-pass valve's air inlet) and vacuum vent.

1. If necessary, warm the engine to normal operating temperature with the transmission in Neutral or Park and the parking brake "ON".
2. Stop the engine and remove the air by-pass valve to check valve hoses at the by-pass valve. For a "tee" system, remove both hoses connecting the by-pass valve to the check valves. Cap the by-pass valve vacuum vent nipple. Remove, or short circuit, any restricting or delaying device in the sense vacuum hose. Install a tachometer.

CAUTION: For the breakerless ignition system, use a tachometer rated for that type of ignition system.

3. With the transmission in Neutral or Park and the parking brake "ON", start the engine. Accelerate the engine to 1500 RPM. Verify that air is flowing from the air by-pass valve hose connections(s) by placing hand over valve connection. Air flow should be heard and felt. If no air flow is detectable, the valve must be replaced.
4. With the transmission in Neutral or Park and the parking brake "ON", accelerate to 1500 RPM. With hand held over the by-pass valve outlet, momentarily (approximately 5 to 8 Seconds), pinch off the sense vacuum hose to the by-pass valve to simulate the air by-pass cycle. Release the pinched hose. Air flow through the by-pass valve should be felt and heard to diminish or stop for a short period of time, then resume as before (normal air flow). The length of time required to resume normal air flow cannot be specified since the time interval is dependent on engine vacuum and the length of time the vacuum line is pinched off. Air will be discharged through the exhaust ports in the valve silencer cover. If this cycle does not occur, the valve must be replaced.
5. Stop the engine and remove the cap from the vacuum vent nipple, and leave nipple open.
6. With the transmission in Neutral or Park and the parking brake "ON", start the engine. Accelerate the engine to 1500 RPM. Virtually no air flow should be detectable from the by-pass valve outlet(s). Air will be discharged from exhaust ports in the silencer housing. If air flow can be felt and heard at the by-pass valve outlet(s) the valve must be replaced.
7. Stop the engine. Correctly connect hoses to the sense vacuum nipple and the vacuum vent nipple.
8. Perform the following test **ONLY** if the air pump supply tester is available:
—Install the thermactor pump pressure gauge (Rotunda Tool #T75L-0487-A, or equivalent) to the air by-pass valve outlet using a short length of appropriate diameter hose. If the air by-pass valve has two outlets, plug the one without the tester. Increase engine speed to 1000 RPM. Observe the pressure produced at the test gauge. The air pressure must be 2.25 (2-1/4) psi minimum. If the air pressure is not within specifications, replace the valve.
9. Turn off the engine, remove all test equipment and connect the air supply hose(s) to the air by-pass valve(s), and tighten all clamps.

Check Valve Test

- a. With the engine stopped, inspect the hose(s), from the check valve to the by-pass valve, for any leaks due to cracks, splits, holes, etc. Replace if required.
- b. Inspect the hose clamps(s) at the check valve(s) for being properly positioned and tightened. Correct, position, tighten or replace as required.
- c. Disconnect the thermactor hose(s) from the check valve to the by-pass valve at the by-pass valve end.
- d. Connect a thermactor check valve tester (Rotunda Tool No. T75L-9487-A or equivalent), to the open end of the check valve hose. Position the hose clamp and tighten to specification.
- e. Squeeze the rubber bulb, on the tester, to force as much air from the bulb as possible. Quickly release the bulb and start timing. The bulb should remain collapsed (not return to its original free shape) for at least 15 seconds.
 1. If the test bulb does not return to its original free shape for 15 Seconds, the check valve and hose are good. Remove the check valve tester from the end of the hose and re-install the hose on the by-pass valve. Position and tighten the hose clamp to specification.
 2. If the test bulb returns to its original free shape in 15 Seconds or less, both hose and check valve are questionable.
 3. Remove the test bulb from the end of the hose. Remove the hose from the check valve. Install a 6 to 18 inch length or appropriate diameter hose to the check valve and test bulb. Position and tighten to specification a hose clamp at each end of the hose. Repeat Step e.
 4. If the test bulb does not return to its original free shape for 15 Seconds it indicates the check valve is good and the original by-pass valve to check valve hose is the problem. Remove the test hose from the check valve and test bulb. Install a new hose of the proper part number to the check valve and test bulb. Position and tighten to specification a hose clamp at each end of the hose. Repeat "Step e" to be sure the new hose does not leak. After testing remove the hose clamp and test bulb. Install the hose on the by-pass valve nipple. Position and tighten the hose clamp to specification.
 5. If the test bulb returns to its original free shape in 15 Seconds or less, the check valve is defective and is to be replaced. Test the new check valve for leaks before installing on the engine. Connect a 6 to 18 inch length of appropriate diameter hose to the new check valve and test bulb. Position and tighten to specification a hose clamp at each end of the hose. Repeat Step e above.

Remove the hose from the check valve. Install the new check valve on the engine and torque to specification.

Install the hose on the check valve and by-pass valve nipples. Route the hose as required. Position and tighten to specification a hose clamp at each end of the hose.

NOTE: If the engine is equipped with 2 check valves, repeat Steps c through e of the "Check Valve Test".

B-9: THERMACTOR IDLE DUMP DELAY VALVE

1. If necessary, remove the air cleaner assembly.
2. Remove the thermactor delay valve from the thermactor dump valve vacuum line.
3. Perform the following delay valve functional test:
 - a. **Equipment Required:**
 - Vacuum gauge—0.30" Hg vacuum gauge with 0.20" OD vacuum hose nipple adapter and 24" of 5/32" ID distributor vacuum hose or equivalent.
 - Stopwatch or wrist watch with a sweep second hand.
 - External vacuum source capable of maintaining a constant vacuum (10" Hg minimum).
 - b. Set external vacuum source to 10" Hg.
 - c. Connect colored side of delay valve to vacuum source.

NOTE: 0.20" OD to 0.27" OD adapter may be required to connect colored side of valve to vacuum source.
 - d. Connect the 24" section of vacuum hose to gauge and to white side of delay valve.
 - e. Apply vacuum and observe time in seconds for gauge to rise from 0 to 8" Hg with a constant 20" Hg vacuum source.
 - f. The minimum and maximum time for the delay valve to reach 8" Hg should be shown in Fig. 6.

CAUTION: When checking the delay valve, do not allow oil or dirt to get into the valve as this will impair its function.
 - g. Replace the delay valve if it fails to meet specification or reinstall the delay valve if it meets specification. The white side of the delay valve should face away from the thermactor dump valve.
 - h. Reinstall air cleaner assembly, if removed, and tighten air cleaner nut(s) to specification.

Color	I.D.	Time In Seconds	
		Minimum	Maximum
White/Red	40	14.0	47.2
White/Blue	20	8.0	26.0

CB3803-1B

FIG. 6 Delay Valve Actuating Time

C.IGNITION SYSTEM

C-1: SPARK PLUG REPLACEMENT

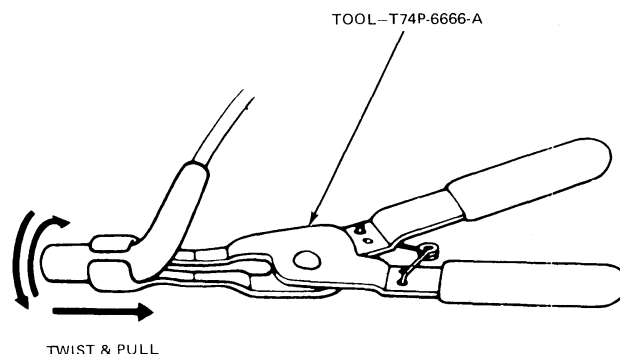
NOTE If the engine is equipped with a "Dura Spark" ignition system and any high tension ignition wire is detached from a spark plug, the distributor cap, or the coil to perform this maintenance operation, silicone grease (Ford No. D7AE-19A331-AA or equivalent) must be applied to the boot before reconnection. Using a small clean screwdriver, apply a thin layer of silicone grease on the entire interior surface of the boot.

1. Remove required components to provide access to spark plugs.
2. When clearance permits, use the spark plug wire installation and removal tool (Rotunda Tool No. T74P-6666-A or equivalent) (Fig. 7). Otherwise, use your hand(s). In either situation, proceed as follows:
 - Remove the spark plug wire from each spark plug by grasping the molded boot, twisting the boot until it loosens and then pulling it off the spark plug. Do not pull on the wire as the connection will be damaged; any spark plug wire and/or boot damaged must be replaced.
3. Each original spark plug wire is numbered as to the plug it should be connected to. If spark plug wires are not numbered, each wire should be marked as to the plug number from which it was removed.
4. Clean the area around each spark plug port with compressed air.
5. Using the proper size spark plug socket, remove each spark plug.
6. Check the gap on each new spark plug and set to specification, if necessary (Fig. 8).
7. Install each spark plug and tighten to specifications (18mm plugs—15-25 ft-lbs).
8. Re-grease the spark plug boots (see above notation) and reinstall the spark plug wires.
9. Reinstall all components which were removed to provide access to the spark plugs.

C-6: DISTRIBUTOR SHAFT BUSHING (OIL CUP) LUBE

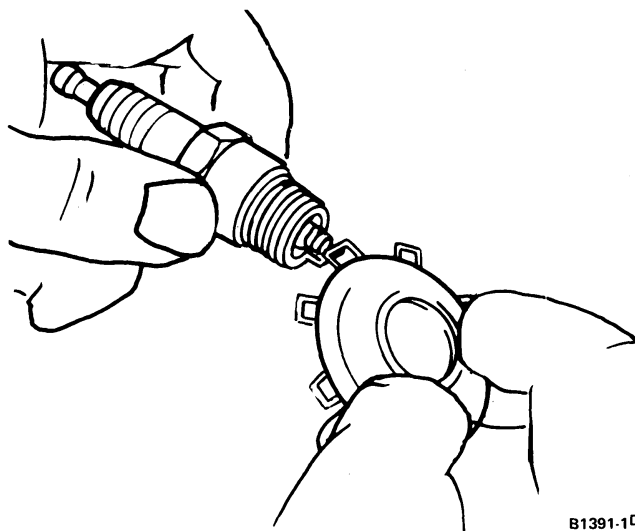
APPLICATION: 7.8L (477 CID) and 8.8L (534 CID) Engines

Squirt a few drops of engine oil into the distributor cup, if so equipped.



B3496-1A

FIG. 7 Removing Wires from Spark Plugs



B1391-1D

FIG. 8 Checking Spark Plug Gap

D. FUEL SUBSYSTEM

D-2: ENGINE IDLE SPEEDS

CHECK AND ADJUST ENGINE IDLE SPEEDS (INCLUDES DECEL THROTTLE CONTROL SPEEDS WHEN APPLICABLE)

1. Application: Some Models Under 8500 GVW

NOTE: To minimize complaints of excessive high idle speed, after engine "break in", idle speed reduction values for "green" engines have been established on some engines. A

"green" engine is an engine which has been operated for less than 100 miles (160 km). The "green" engine idle speed adjustment is the final engine adjustment made during pre-delivery. Idle mixture and timing adjustments are made with the idle speed set to "normal" specifications—then the "green" engine idle speed is set. The "normal" and "under 100 miles" (160 km) specifications are shown in the Vehicle Emission Control Information

(VECI) Decal. Note that when an "Idle Speed Reduction" rpm is shown on the VECI Decal, it is subtracted from the "normal" specification to obtain the "green" engine idle speed. The idle rpm tolerances shown on the VECI decal do not apply to "green" engines.

4.9L (300 CID) WITH CARTER YFA IV (TRUCKS UNDER 8500 GVW)

I. Pre-Adjustment Instruction (All Engine Speeds)

NOTE: Vehicles equipped with speed control—In the event specified engine idle speed cannot be achieved by normal adjustments, disconnect the accelerator cable at the carburetor throttle lever. If specified engine idle speed can be achieved with the accelerator cable disconnected, check speed control installation per procedure outlined in appropriate vehicle shop manual before reinstalling accelerator cable. If engine idle speed cannot be adjusted, perform Routine 108—Engine Idle Speed Varies.

- A. Apply the parking brake and block the wheels.
- B. Turn off all accessories.
- C. Remove the air cleaner assembly and plug the vacuum line(s) to the air cleaner.
- D. Revise the dump valve lines as follows:
 1. For dump valves with one or two vacuum lines at the side disconnect and plug the line(s).
 2. For dump valves with one vacuum line at the top only, check the line to see it is connected to the intake manifold. If not, remove the line at the dump valve and plug it. Connect a slave line from the dump valve vacuum fitting to an intake manifold vacuum fitting.
- E. Check throttle and choke linkages for freedom of movement. Correct as required.
- F. Connect a Rotunda Tachometer No. 20362 or equivalent.

II. Fast Idle Speed

- A. Remove the spark delay valve, if so equipped, from the distributor vacuum advance line, and route the vacuum line directly to the advance side of the distributor.
- B. Trace the EGR signal vacuum line from the EGR valve to the carburetor:

NOTE: If an EGR-PVS valve or temperature vacuum switch is located in the vacuum line routing disconnect the EGR vacuum line at the EGR valve and plug the line.
- C. Trace spark advance signal line from distributor to carburetor, of a spark/PVS valve or TVS is located in the vacuum line routing, disconnect the distributor vacuum line at the distributor and plug the line.
- D. If not equipped with an EGR/PVS, Spark/PVS valve or temperature vacuum switch **do not detach** the EGR vacuum line or spark line.
- E. Disconnect the fuel evaporative purge valve signal vacuum line as follows. Trace the purge valve vacuum line from the purge valve (located on the canister) to the first point where the vacuum line can be detached from the underhood

hose routing, e.g.: vacuum "tee" connection, etc. Disconnect the vacuum line at that point, cap the open port, and plug the vacuum line.

CAUTION: To prevent damage to the purge valve, do not disconnect the vacuum line at the purge valve.

- F. With the engine running at normal operating temperature, the choke plate fully opened, and the transmission in Neutral (M/T) or Park (A/T), place the fast idle lever on the specified step of the fast idle cam. Allow engine speed to stabilize and measure the fast idle rpm. Adjust the fast idle speed if not to specification. (Refer to the Vehicle Emission Control Information Decal for the specified cam and idle speed).
 - G. Run engine at approximately 2500 rpm for 15 seconds and recheck fast idle speed.
 - H. Repeat Steps F and G until the fast idle speed can be repeated.
 - I. Reconnect the vacuum line(s)/spark delay valve (if so equipped) removed in Steps A through C.
- ##### III. Curb Idle Speed
- A. Run engine at approximately 2500 rpm for 15 seconds.
 - B. Allow engine to return to curb idle and place transmission selector in Drive (A/T) or Neutral (M/T).
 - C. Allow engine to stabilize at curb idle speed.
 - D. Measure curb idle speed and adjust if not to specification. (Refer to the Vehicle Emission Control Information Decal for the specified idle speed).
 - E. Curb idle speed is set by adjusting engine idle control hardware located on throttle lever side of the carburetor.
 1. If no hardware is present, set the speed by curb idle adjusting screw.
 2. If a throttle solenoid positioner is present, set the curb idle speed by rotating the hexagon nut on the end of the solenoid plunger.
 3. If a solenoid dashpot (solopot) is present, set the curb idle speed by rotating the dashpot assembly.
 - F. Repeat Steps A thru E until the curb idle speed can be repeated.
- ##### IV. TSP OFF Speed (Anti-Dieseling Solenoid; includes Solenoid-Dashpot Assembly, if so equipped)
- A. Collapse the plunger by forcing the throttle lever against the plunger, stopping on the curb idle adjusting screw.
 - B. Check the TSP OFF speed and adjust if not to specification. (Refer to the Vehicle Emission Control Information Decal for the specified speed).
- ##### V. Post-Adjustment Instructions (All Engine Speeds)
- A. Correct the dump valve vacuum line routing (see Step D, Section I in the Pre-Adjustment Instructions).
 - B. Reinstall air cleaner assembly and reconnect vacuum line(s).

- C. Run engine at approximately 2500 rpm for 15 seconds and recheck curb idle speed. Adjust if not to specification. (Refer to the Vehicle Emission Control Information Decal).

NOTE: Final curb idle speed measurement must be taken with the air cleaner assembly installed.

NOTE: If a final curb idle speed adjustment is required on engines equipped with a dash pot, the dash pot clearance must be checked and adjusted to the specified clearance as listed in the Truck Performance Specification Book.

NOTE: If a final curb idle speed adjustment is required the bowl vent setting must be checked as follows (See Fig. 9).

1. Stop the engine and turn the ignition key to the "ON" position so that the solepot is activated but the engine is not running (where applicable). Secure the choke plate in the wide-open position.
2. Open the throttle so that the throttle vent lever does not touch the fuel bowl vent rod (See Fig. 9).
3. Close the throttle and measure the travel of the fuel bowl vent rod at point "A" from the open throttle position (Step 2 as designated on Figure 1). Travel of the fuel bowl vent rod at point "A" should be within specification as listed in The Truck Performance Specification Book.
4. If out of specification, bend the throttle vent lever at point indicated in the figure, to obtain the required travel.
5. Remove all test equipment and torque the air cleaner hold down bolt to specification.

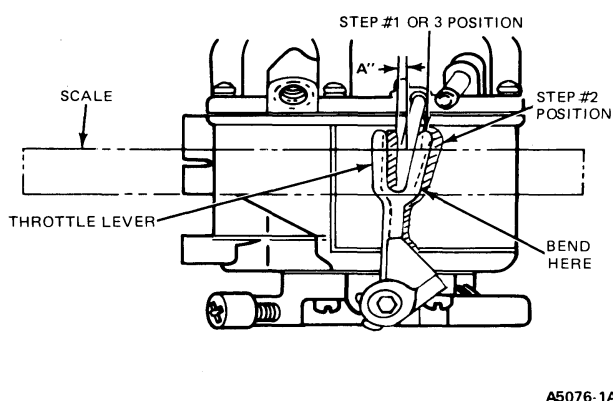


FIG. 9 YFA Carburetor—Bowl Vent Setting

- D. EGR WOT Dump Valve Adjustment

NOTE: The following procedure applies to carburetors equipped with EGR WOT dump valve. Check and adjust as follows: (See Fig 10).

1. Loosen Lock Nut "A".
2. Rotate EGR WOT Dump Valve "B" to an outward position.
3. Rotate throttle lever to the wide-open position.

4. Move the EGR WOT Dump Valve "B" inward until it touches lever "C".
5. With Lever "C" returned to its idle position, rotate EGR WOT Dump Valve "B" two turns inward.
6. Tighten lock nut "A".

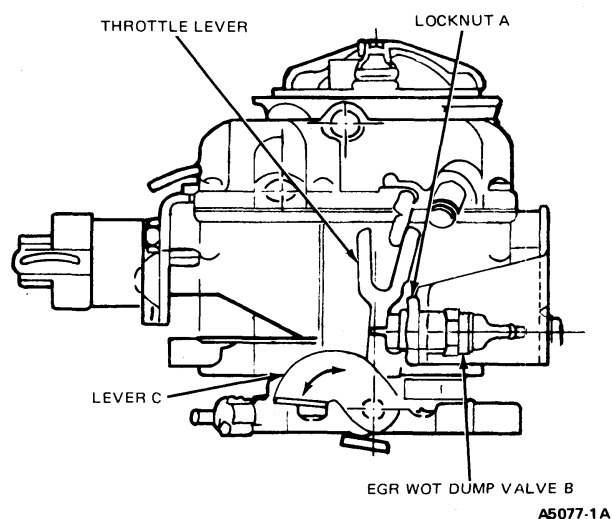


FIG. 10 YFA Carburetor—EGR WOT Dump Valve Adjustment

4.9L (300 CID) WITH CARTER YFA (TRUCKS OVER 8500 GVW) (INCLUDES DECEL THROTTLE CONTROL SPEEDS WHEN APPLICABLE)

I. Pre-Adjustment Instructions

- A. Apply parking brake and block the wheels.
- B. Turn off all accessories. Disengage all power take-off units, if so equipped.
- C. With transmission in Neutral (M/T) or Park (A/T), start the engine. Run the engine until normal operating temperature is reached, and then, stop the engine.
- D. Remove the air cleaner assembly and plug the vacuum hose(s) to the assembly.
- E. Check throttle and choke linkages for freedom of movement. Correct as required.
- F. Disconnect system vacuum hose to the decel throttle control diaphragm and plug the hose.
- G. If so equipped, disconnect the fuel evaporative purge valve signal vacuum line as follows: Trace the purge valve vacuum line from the purge valve (located on the canister), to the first point where the vacuum line can be detached from the underhood hose routing, e.g.: vacuum "tee" connection, etc. Disconnect the vacuum line at that point, cap the open port, and plug the vacuum line.

CAUTION: TO PREVENT DAMAGE TO THE PURGE VALVE, DO NOT DISCONNECT THE VACUUM LINE AT THE PURGE VALVE.

- H. Connect the tachometer.

II. Fast Idle Speed

- A. If the engine is equipped with a retard delay valve, remove the delay valve and install a bypass hose between the remaining vacuum hose ends.

- B. Disconnect the EGR vacuum hose at the EGR valve and plug the hose.
- C. With the engine at normal operating temperature and choke plate fully open, check fast idle speed as follows:

NOTE: Before each speed check, run engine at approximately 2500 rpm for 15 seconds in Neutral/Park.

- 1. Carburetors Equipped with Automatic Choke
 - a. Depress the throttle lever and manually rotate the fast idle cam until the fast idle adjusting screw rests on the 2nd. step of the cam.
 - b. Check fast idle speed and compare to specification as listed on the Vehicle Emission Control Information Decal. If necessary, adjust the fast idle speed adjusting screw.
 - c. Repeat Steps a and b until specified fast idle speed can be repeated.
- D. Reconnect the EGR vacuum hose at the EGR valve.
- E. If the spark delay valve was removed, detach the by-pass hose and reinstall the delay valve. Make sure the white side of the delay valve faces the distributor advance unit.

III. Curb Idle and Decel Throttle Control Speeds

- A. Check the curb idle speed as follows:
 - 1. For carburetors equipped with a TSP device or a solenoid-dashpot, verify that the solenoid is energized. Correct as required.
 - 2. Run the engine at approximately 2500 rpm for 15 seconds and then allow engine to return to curb idle.
 - 3. Allow the engine speed to stabilize and compare curb idle engine speed to specification as listed on the Vehicle Emission Control Information Decal. If the engine speed is not within specification, adjust the curb idle speed as follows:

- a. On carburetors equipped with TSP, loosen the solenoid body locknut, then rotate the solenoid body until the specified curb idle speed is obtained. Tighten the solenoid locknut to lock the solenoid in place on the mounting bracket.

NOTE: If necessary, temporarily disconnect the solenoid wire (to prevent twisting) when rotating the solenoid body.

- b. On carburetors with no solenoid device, rotate the throttle adjusting screw until the specified curb idle speed as listed on the Vehicle Emission Control Information Decal, is obtained.

NOTE: Check dashpot clearance, if equipped, each time the curb idle speed is adjusted. Collapse the dashpot stem and check the clearance between the collapsed stem and the throttle lever pad. Adjust if not to specification. (Refer to the Truck Performance Specifications Book).

- 4. Repeat Steps 2 and 3 until the specified curb idle speed is repeatable.

- B. On engines equipped with separate decel throttle control diaphragm and TSP, check the decel throttle control engine speed as follows:

- 1. Make sure the curb idle speed is adjusted to specification as listed on the Vehicle Emission Control Information Decal in accordance with Step A.
- 2. Connect a slave vacuum hose from an engine manifold vacuum source to the diaphragm.
- 3. With the transmission selector in Neutral/Park, run the engine at approximately 2500 rpm for 15 seconds. Then, release the throttle.
- 4. Allow one (1) minute for the engine speed to stabilize, then compare the engine speed to specification. If the engine speed is not to specification, adjust the diaphragm shaft length by loosening the lock nut, if so equipped (see note below) on the adjusting screw. Rotate the screw until the specified engine speed is obtained. Re-tighten the lock nut (if so equipped).

NOTE: Avoid damage to the vacuum diaphragm by holding the diaphragm shaft with a 1/4" open-end wrench. Using a second 1/4" open-end wrench, turn the adjusting screw in or out.

- 5. Allow the engine to return to curb idle speed by disconnecting the slave manifold vacuum hose from the diaphragm and plugging the hose.
- 6. Repeat Steps 1 thru 4 until the specified engine speeds are repeatable.
- C. Check the dash pot clearance, if so equipped. Collapse the dash pot stem and check the clearance between the collapsed dash pot stem and the throttle lever pad. Adjust if not to specification. (Refer to the Truck Performance Specifications Book).

IV. TSP OFF Idle Speed

- A. With the engine idling and the transmission selector in Neutral/Park, collapse the solenoid plunger by forcing the throttle lever pad against the plunger.
- B. Measure TSP OFF idle speed and compare to specification. (Refer to the Vehicle Emission Control Information Decal). If the engine speed is not within specification, adjust the throttle adjusting screw until the specified engine speed is obtained.

V. Post Adjustment Instructions

- A. Remove the slave manifold vacuum hose from the engine and reconnect the decel throttle control vacuum hose to the diaphragm.
- B. Reinstall the air cleaner assembly and reconnect vacuum hose(s).
- C. Recheck curb idle speed. Adjust if not to specification as shown on the Vehicle Emission Control Information Decal.

NOTE: Final curb idle speed must be taken with the air cleaner assembly installed.

- D. Stop the engine. Remove all test equipment and tighten the air cleaner wing nut(s) to specification.

- E. If the carburetor is equipped with a mechanical bowl vent and a final curb idle speed adjustment was required, the bowl vent setting must be checked as follows (See Fig. 1).
1. Stop the engine and turn the ignition key to the "ON" position so that the solenoid is activated but the engine is not running (where applicable). Secure the choke plate in the wide open position.
 2. Open the throttle so that the throttle vent lever does not touch the fuel bowl vent rod (See Fig. 1).
 3. Close the throttle and measure the travel of the fuel bowl vent rod at point "A" from the open throttle position (Step 2 as designated on figure shown on previous page). Travel of the fuel bowl vent rod at point "A" should be within specification. (Refer to the Truck Performance Specification Book.)
 4. If out of specification bend the throttle vent lever at point indicated in the figure, to obtain the required travel.
 5. Remove all test equipment and torque the air cleaner wing nut to specification.
- F. The following procedure applies to engines equipped with EGR WOT dump valves. Check and adjust as follows: (See Fig. 2).
1. Loosen Lock Nut A.
 2. Rotate EGR WOT dump valve B to an outward position.
 3. Rotate throttle lever to the wide-open position.
 4. Move the EGR WOT dump valve B inward until it just touches lever C.
 5. With Lever C returned to its idle position, rotate EGR WOT dump valve B two turns inward.
 6. Tighten lock nut A.

5.0L (302) AND 5.8L (351W CID) WITH 2150-2V (TRUCKS UNDER 8500 GVW)

I. Pre-Adjustment Instruction (All Engine Speeds)

- A. Apply the parking brake and block the wheels.
- B. Turn off all accessories.
- C. Remove the air cleaner assembly and plug the vacuum line(s) to the air cleaner.
- D. Revise the dump valve lines as follows:
 1. For dump valves with one or two vacuum lines at the side disconnect and plug the line(s).
 2. For dump valves with one vacuum line at the top only, check the line to see it is connected to the intake manifold. If not, remove the line at the dump valve and plug it. Connect a slave line from the dump valve vacuum fitting to an intake manifold vacuum fitting.
- E. Check throttle and choke linkages for freedom of movement. Correct as required.
- F. Connect a Rotunda Tachometer No. 20362 or equivalent.

NOTE: Vehicles equipped with speed control—In the event specified engine idle speed cannot be achieved by normal adjustments, disconnect the accelerator cable at the carburetor throttle lever. If

specified engine idle speed can be achieved with the accelerator cable disconnected, check speed control installation per procedure outlined in appropriate vehicle shop manual before reinstalling accelerator cable. If engine idle speed cannot be adjusted, perform Routine 108—Engine Idle Speed Varies.

II. Fast Idle Speed

- A. 1. Vehicles equipped with 5.0L (302 CID) engines remove the spark delay valve, if so equipped, from the distributor vacuum advance line, and route the vacuum line directly to the advance side of the distributor.
If a PVS lock out is used in the distributor vacuum advance hose, remove the vacuum hose at the distributor and plug.
2. Vehicles equipped with 5.8L (351W CID) engine, do not remove vacuum hose from distributor.
- B. Trace the EGR signal vacuum line from the EGR valve to the carburetor:
 1. If an EGR/PVS valve or temperature vacuum switch is located in the vacuum line routing disconnect the EGR vacuum line at the EGR valve and plug the line.
 2. If not equipped with an EGR/PVS valve or temperature vacuum switch do not detach the EGR vacuum line.
- C. Disconnect the fuel evaporative purge valve signal vacuum line as follows: Trace the purge valve vacuum line to the remote purge valve. Disconnect the vacuum line at that point, and plug the vacuum line.
- D. If the vehicle is equipped with a continuous purge system thru the PCV leave the system in place.
- E. With the engine running at normal operating temperature, the choke plate fully opened, and the transmission in Neutral (M/T) or Park (A/T), place the fast idle lever on the specified step of the fast idle cam. (Refer to the Vehicle Emission Control Information Decal). Allow engine speed to stabilize and measure the fast idle rpm. Adjust the fast idle speed if not to specification. (Refer to the Vehicle Emission Control Information Decal for specified idle speed).
- F. Run engine at approximately 2500 rpm for 15 seconds and recheck fast idle speed.
- G. Repeat Steps D and E until the fast idle speed can be repeated.
- H. Reconnect the vacuum line(s) spark delay valve (if so equipped) removed in Steps A thru C.

III. Curb Idle Speed

- A. Run engine at approximately 2500 rpm for 15 seconds.
- B. Allow engine to return to curb idle and place transmission selector in Drive (A/T) or Neutral (M/T).
- C. Allow engine to stabilize at curb idle speed.
- D. Measure curb idle speed and adjust if not to specification. (Refer to the Vehicle Emission Control Information Decal specified idle speed).

NOTE: If the curb idle speed cannot be adjusted low enough check for the presence of a dash pot. If so equipped, adjust the dash pot until there is clearance between the dashpot stem and the throttle lever pad.

- E. Repeat Steps A through D until the curb idle speed can be repeated.
- F. Check dash pot clearance, if so equipped. Collapse the dash pot stem and check the clearance between the collapsed dash pot stem and throttle lever pad. Adjust if not to specification as listed in the Truck Performance Specifications Book.

IV. TSP Off Speed (Anti-Dieseling Solenoid; includes Solenoid-Dash Pot Assembly, if so equipped)

- A. Collapse the plunger by forcing the throttle lever against the plunger.
- B. Check the TSP OFF speed and adjust if not to the specification listed on the Vehicle Emission Control Information Decal.

V. Post-Adjustment Instructions (All Engine Speeds)

- A. Correct the dump valve vacuum line routing (see Step D, Section I in the Pre-Adjustment Instructions).
- B. Reinstall air cleaner assembly and reconnect vacuum line(s).
- C. Run engine at approximately 2500 rpm for 15 seconds and recheck curb idle speed. Adjust if not to specification.

NOTE:

a. Final curb idle speed measurement must be taken with the air cleaner assembly installed.

b. If a final curb idle speed adjustment is required on engines equipped with a dash pot, the dash pot clearance must be checked and adjusted to the specified clearance. (See Step F of Section III).

5.8L (351M CID) AND 6.6L (400 CID) WITH 2150-2V (TRUCKS UNDER 8500 GVW)

I. Pre-Adjustment Instruction (All Engine Speeds)

- A. Apply the parking brake and block the wheels.
- B. Turn off all accessories.
- C. Remove the air cleaner assembly and plug the vacuum line(s) to the air cleaner.
- D. Revise the dump valve lines as follows:
 1. For dump valves with one or two vacuum lines at the side disconnect and plug the line(s).
 2. For dump valves with one vacuum line at the top only, check the line to see it is connected to the intake manifold. If not, remove the line at the dump valve and plug it. Connect a slave line from the dump valve vacuum fitting to an intake manifold vacuum fitting.
- E. Check throttle and choke linkages for freedom of movement. Correct as required.
- F. Connect a Rotunda Tachometer No. 20362 or equivalent.

NOTE: Vehicles equipped with speed control—In the event specified engine idle speed cannot be achieved by normal adjustments, disconnect the accelerator cable at the carburetor throttle lever. If specified engine idle speed can be achieved with the accelerator cable disconnected, check speed control installation per procedure outlined in appropriate vehicle shop manual before reinstalling accelerator cable. If engine idle speed cannot be adjusted, perform Routine 108—Engine Idle Speed Varies.

II. Fast Idle Speed

- A. Remove the spark delay valve, if so equipped, from the distributor vacuum advance line, and route the vacuum line directly to the advance side of the distributor.
- B. Trace the EGR signal vacuum line from the EGR valve to the carburetor:
 1. If an EGR/PVS valve or temperature vacuum switch is located in the vacuum line routing, disconnect the EGR vacuum line at the EGR valve and plug the line.
 2. If not equipped with an EGR/PVS valve or temperature vacuum switch, do not detach the EGR vacuum line.
- C. Disconnect the fuel evaporative purge valve signal vacuum line as follows: Trace the purge valve vacuum line from the purge valve (located on the canister) to the first point where the vacuum line can be detached from the underhood hose routing, e.g.: vacuum "tee" connection, etc. Disconnect the vacuum line at that point, cap the open port and plug the vacuum line.
- D. If equipped with a continuous purge system through the PCV, leave the system in place.
- E. With the engine running at normal operating temperature, the choke plate fully opened, and the transmission in Neutral (M/T) or Park (A/T), place the fast idle lever on the specified step of the fast idle rpm. Allow engine speed to stabilize and measure the fast idle rpm. Adjust the fast idle speed if not to specification. (Refer to the Vehicle Emission Control Information Decal for specified cam step and idle speed).

- F. Run engine at approximately 2500 rpm for 15 seconds and recheck fast idle speed.

- G. Repeat Steps D and E until the fast idle speed can be repeated.

- H. Reconnect the vacuum line(s)/spark delay valve (if so equipped) removed in Steps A thru C.

III. Pre-Curb Idle rpm Check or Adjustment

- A. Run engine at approximately 2500 rpm for 15 seconds.
- B. Allow engine to return to curb idle and place transmission selector in Drive (A/T) or Neutral (M/T).
- C. Allow engine to stabilize at curb idle rpm.
- D. Measure curb idle speed and adjust if not to specification. (Refer to the Vehicle Emission Control Information Decal for specified cam step, and idle speed).

IV. Curb Idle—Manual Transmission A/C and Non-A/C, Automatic Transmission Non-A/C (Carburetor Equipped with Dash Pot).

- A. Adjust curb idle RPM by turning the throttle stop adjusting screw until the specified RPM is obtained. Refer to the Vehicle Emission Control Information Decal for specified idle speed.

NOTE: If the curb idle RPM cannot be adjusted low enough, check the specified clearance between the dash pot stem and throttle lever.

- B. Repeat Steps A thru D of Section III until curb idle RPM can be repeated.
- C. Check dash pot clearance between the dash pot stem and the throttle lever; adjust if not to specification as listed in the Truck Performance Specification Book.

V. Curb Idle—Automatic Transmission with A/C (Carburetor Equipped with Solenoid Dash Pot).

- A. A/C OFF—Verify that the throttle stop adjusting screw is not engaging the throttle lever pad and that the dash pot is completely collapsed. Adjust curb idle RPM by turning the long screw (part of the solenoid dash pot bracket) until specified A/C OFF RPM is obtained. Refer to the Vehicle Emission Control Information Decal for specified idle speed.

- B. Repeat Steps A thru D of Section III until curb idle A/C OFF RPM can be repeated.

- C. A/C ON (Solenoid Dash Pot Energized)

1. Shut the engine off, then turn the ignition switch to the "Engine Run" position—DO NOT START.
2. Move the climate control selector to the A/C ON position.
3. Manually move the throttle lever away from the energized solenoid dash pot and observe that a new throttle stop position is obtained.
4. If the solenoid dash pot does not extend, verify the A/C selector position and solenoid dash pot connection. Repair or replace as required.

NOTE: There is no curb idle A/C ON specification.

VI. Post-Adjustment Instructions (All Engine Speeds).

- A. Correct the dump valve vacuum line routing (see Step D, Section I in the Pre-Adjustment Instructions).
- B. Re-install the air cleaner assembly and re-connect the pertinent vacuum line(s).
- C. Run the engine at approximately 2500 RPM for 15 Seconds and re-check the curb idle speed. Adjust if not to specification.

5.8L (351M CID) AND 6.6L (400 CID) WITH 2150-2V (TRUCKS OVER 8500 GVW)

I. Pre-Adjustment Instruction (All Engine Speeds)

- A. Apply the parking brake and block the wheels.
- B. Turn off all accessories. Disengage all power take-off units, if so equipped.

- C. With transmission in Neutral (M/T) or Park (A/T), start the engine. Run the engine until normal operating temperature is reached, and then, stop the engine.

- D. Remove the air cleaner assembly and plug the vacuum line(s) to the air cleaner.

- E. Check throttle and choke linkages for freedom of movement. Correct as required.

- F. Disconnect system vacuum hose to the decel throttle control diaphragm and plug the hose.

- G. If so equipped, disconnect the fuel evaporative purge valve signal vacuum line as follows: Trace the purge valve vacuum line from the purge valve (located on the canister), to the first point where the vacuum line can be detached from the underhood hose routing, e.g.: vacuum "tee" connection, etc. Disconnect the vacuum line at that point, cap the open port, and plug the vacuum line.

CAUTION: To prevent damage to the purge valve, do not disconnect the vacuum line at the purge valve.

- H. If equipped with a continuous purge system through the PCV, leave the system in place.

- I. Connect a Rotunda Tachometer No. 20362 or equivalent.

II. Fast Idle Speed

- A. If the distributor vacuum line is equipped with a retard delay valve, remove the delay valve and install a jumper vacuum hose between the remaining vacuum hose ends.

- B. Disconnect the EGR vacuum hose at the EGR valve and plug the hose.

- C. With the engine at normal operating temperature and choke plate fully open, check fast idle speed as follows:

NOTE: Before each speed check, run engine at approximately 2500 RPM for 15 Seconds in Neutral/Park.

1. Depress the throttle lever and manually rotate the fast idle cam until the fast idle adjusting screw rests on the specified step of the cam.

2. Check fast idle speed and compare to specification. (Refer to the Vehicle Emission Control Information Decal for specified cam step and idle speed.) If necessary, adjust the fast idle speed adjusting screw.

3. Repeat Steps # 1 and 2 until specified fast idle speed can be repeated.

- D. If the retard delay valve was removed, detach the jumper vacuum hose and re-install the delay valve, making sure the white side of the delay valve faces the distributor advance unit.

- E. Reconnect the EGR Vacuum hose at the EGR valve.

III. Curb Idle and Decel Throttle Control Speeds.

NOTE: Step # A and C of the following procedure are applicable only to engines having decel throttle control mechanism.

- A. On engines equipped with integral decel throttle control diaphragm and TSP, check the decel throttle control engine speed as follows:

1. Verify that the throttle solenoid is energized. Correct as required.
 2. Connect a slave vacuum hose from an engine manifold vacuum source to the diaphragm.
 3. Run the engine at approximately 2500 rpm for 15 seconds; then release the throttle.
 4. Allow one (1) minute for the engine speed to stabilize, then compare engine speed to the specification listed on the Vehicle Emission Control Information Decal. If the engine speed is not to specification, adjust the solenoid positioner by rotating the long screw (part of the mounting bracket) until the specified engine speed is obtained.
 5. Allow engine to return to curb idle speed by disconnecting the slave manifold vacuum hose from the diaphragm and plugging the hose.
- B. Check the curb idle speed as follows:
1. For carburetors equipped with a TSP device or a solenoid-dashpot, verify that the solenoid is energized. Correct as required.
 2. Run the engine at approximately 2500 rpm for 15 seconds and then allow engine to return to curb idle.
 3. Allow the engine speed to stabilize and compare curb idle engine speed to specification as listed on the Vehicle Emission Control Information Decal. If the engine speed is not within specification, adjust the curb idle speed as follows:
 - a. On carburetors equipped with a separate TSP, adjust the solenoid positioner by rotating the long screw (part of the mounting bracket) until the specified curb idle speed is obtained.
 - b. On carburetors equipped with the integral decel throttle control diaphragm and TSP or equipped with a solenoid-dashpot, rotate the hex head on the rear of the solenoid until the specified curb idle speed is obtained.
 - c. On carburetors with no solenoid device, rotate the throttle adjusting screw until the specified curb idle speed is obtained.

NOTE: Check dashpot clearance, if equipped, each time the curb idle speed is adjusted. Collapse the dashpot stem and check the clearance between the collapsed stem and the throttle lever pad. Adjust if not to specification. (Refer to the Truck Performance Specifications Book).
 4. Repeat Steps 2 and 3 until the specified curb idle speed is repeatable.
- C. On engines equipped with integral decel throttle control diaphragm and TSP, repeat Steps 3, a and b until both specified engine speeds are repeatable.
- D. Check dashpot clearance, if so equipped. Collapse the dashpot stem and check the clearance between the collapsed dashpot stem and the throttle lever pad. Adjust if not to specification.

IV TSP-Off Idle Speed

- A. With the engine idling and the transmission selector in Neutral/Park, collapse the solenoid plunger by forcing the throttle lever pad against the plunger.
- B. Measure the TSP-OFF idle speed and compare to specification. (Refer to the Vehicle Emission Control Information Decal). If the engine speed is not within specification, adjust the throttle adjusting screw until the specified engine speed is obtained.

V. Post Adjustment Instructions

- A. Remove the slave manifold vacuum hose from the engine and reconnect the decel throttle control vacuum hose to the diaphragm.
- B. Reinstall the air cleaner assembly and reconnect vacuum hose(s).
- C. Recheck curb idle speed. Adjust if not to specification.
NOTE: Final curb idle speed must be taken with the air cleaner assembly installed.
- D. Stop the engine. Remove all test equipment and tighten the air cleaner wing nut(s) to specification.

6.1L (370 CID) WITH HOLLEY 2300 EG-2V, 6.1L (370 CID) AND 7.0L (429 CID) WITH HOLLEY 4180 EG-4V (TRUCKS OVER 8500 GVW) (INCLUDES DECEL THROTTLE CONTROL SPEEDS WHEN APPLICABLE)

I. Pre-Adjustment Instructions

- A. Apply parking brake and block the wheels.
- B. Turn off all accessories. Disengage all power take-off units, if so equipped.
- C. With transmission in Neutral (M/T) or Park (A/T), start the engine. Run the engine until normal operating temperature is reached, and then, stop the engine.
- D. Remove the air cleaner assembly and plug the vacuum hose(s) to the assembly.
- E. Check throttle and choke linkages for freedom of movement. Correct as required.
- F. Disconnect system vacuum hose to the decel throttle control diaphragm and plug the hose.
- G. If so equipped, disconnect the fuel evaporative purge valve signal vacuum line as follows: Trace the purge valve vacuum line from the purge valve (located on the canister), to the first point where the vacuum line can be detached from the underhood hose routing, e.g.: vacuum "tee" connection, etc. Disconnect the vacuum line at that point, cap the open port, and plug the vacuum line.
CAUTION: To prevent damage to the purge valve, do not disconnect the vacuum line at the purge valve.
- H. Connect a tachometer.

II. Fast Idle Speed

- A. If the distributor vacuum line is equipped with a retard delay valve, remove the delay valve and install a jumper vacuum hose between the remaining vacuum hose ends.

- B. Disconnect the EGR vacuum hose at the EGR valve and plug the hose.
- C. With the engine at normal operating temperature and choke plate fully open, check fast idle speed as follows:

NOTE: Before each speed check, run engine at approximately 2500 rpm for 15 seconds in Neutral/Park.

1. For 2V Holley Carburetor Model 2300 EG (Manual Choke):
 - a. Pull the choke control (on the control panel) to fullchoke. The choke plate should now be closed.
 - b. Manually open the choke plate by pushing against the choke shaft lever until the choke link contacts the bottom or the slot in the choke shaft lever.
 - c. Check choke pulldown setting by inserting a 0.375 in. gauge between the choke plate and the air horn in the downstream side of the choke. If necessary, bend the choke lever stop tang to obtain specified pulldown setting.
 - d. Check fast idle speed (while the choke plate is being held against its stop). If necessary, adjust fast idle speed to specification using the fast idle adjusting screw. (Refer to the Vehicle Emission Control Information Decal for specified idle speed).
 - e. Repeat Steps a thru d until the specified idle speed can be repeated.
2. For 4V Holley Carburetor Model 4180 EG:

NOTE: To adjust the fast idle speed screw on the 4180 EG, use Kent-Moore Tool No. J-10176-K, or equivalent.

 - a. Pull choke control to full choke position. Choke plate should be closed.
 - b. Manually open the choke plate until it stops. Check choke pulldown setting by inserting a 0.210 in. gauge between the choke plate and the air horn in the downstream side of the choke. If necessary, bend the choke rod at the dog leg to obtain specified pulldown setting.
 - c. Insert a 0.375 in. gauge in the downstream side of the choke plate and check fast idle speed. If necessary, adjust fast idle speed to specification, using the fast idle adjusting screw.
 - d. Return choke plate to vertical position. (Choke off).
 - e. Repeat Steps a thru c until the specified fast idle speed can be repeated.
- D. If the retard delay valve was removed, detach the jumper vacuum hose and reinstall the retard delay valve, making sure the white side of the retard delay valve faces away from the distributor vacuum advance unit.
- E. Reconnect the EGR vacuum hose at the EGR valve.

III. Curb Idle and Decel Throttle Control Speeds

NOTE: Steps A, C, and D of the following procedure are applicable only to engines having a decel throttle control mechanism.

- A. On engines equipped with **integral** decel throttle control diaphragm and TSP, check the decel throttle control engine speed as follows:
 1. If equipped with throttle solenoid, verify that the throttle solenoid is energized. Correct as required.
 2. Connect a slave vacuum hose from an engine manifold source to the diaphragm.
 3. Run the engine at approximately 2500 rpm for 15 seconds. Then release the throttle.
 4. **Integral Decel Throttle Control System Only:** Allow one (1) minute for the engine speed to stabilize. Then, compare engine speed to specification as listed on the Vehicle Emission Control Information Decal. If the engine speed is not to specification, adjust the solenoid positioner by rotating the long screw (part of the mounting bracket) until the specified engine speed is obtained.
 5. Allow engine to return to curb idle speed by disconnecting the slave manifold vacuum hose from the diaphragm and plugging the hose.
- B. Check the curb idle speed as follows:
 1. For carburetors equipped with a TSP device or a solenoid-dashpot, verify that the solenoid is energized. Correct as required.
 2. Run the engine at approximately 2500 rpm for 15 seconds, then allow engine to return to curb idle.
 3. Allow the engine speed to stabilize and compare curb idle engine speed to specification as listed on the Vehicle Emission Control Information Decal. If the engine speed is not to specification, adjust the curb idle speed as follows:
 - a. On carburetors equipped with a separate TSP, adjust the solenoid positioner by rotating the long screw (part of the mounting bracket) until the specified curb idle speed is obtained.
 - b. On carburetors equipped with the **integral** decel throttle control diaphragm and TSP or equipped with a solenoid-dashpot, rotate the hex head on the rear of the solenoid until the specified curb idle speed is obtained.
 - c. On carburetors with no solenoid device, rotate the throttle adjusting screw until the specified curb idle speed is obtained.

NOTE: Check dashpot clearance, if equipped, each time the curb idle speed is adjusted. Collapse the dashpot stem and check the clearance between the collapsed stem and the throttle lever pad. Adjust if not to specification. (Refer to Truck Performance Specifications Book).
 4. Repeat Steps 2 and 3 until the specified curb idle speed is repeatable.
- C. On engines equipped with **integral** decel throttle control diaphragm and TSP, repeat Steps A and B until both specified engine speeds are repeatable.

- D. On engines equipped with **separate** decel throttle control diaphragm and TSP, check the decel throttle control engine speed as follows:
 1. Make sure the curb idle speed is adjusted to specification in accordance with Step B.
 2. Connect a slave vacuum hose from an engine manifold vacuum source to the diaphragm.
 3. With the transmission selector in Neutral/Park, run the engine at approximately 2500 rpm for 15 seconds. Then, release throttle.
 4. Allow one (1) minute for the engine speed to stabilize; then compare the engine speed to specification as specified on the Vehicle Emission Control Information Decal. If the engine speed is not to specification, adjust the diaphragm positioner by loosening the lock nut on the positioner and rotate the positioner until the specified engine speed is obtained. Retighten the lock nut.
 5. Allow the engine to return to curb idle speed by disconnecting the slave manifold vacuum hose from the diaphragm and plugging the hose.
 6. Repeat Steps 1 thru 4 until the specified engine speeds are repeatable.
- E. Check the dash pot clearance, if so equipped. Collapse the dash pot stem and check the clearance between the collapsed dash pot stem and the throttle lever pad. Adjust if not to specification. (Refer to the Truck Performance Specifications Book).

IV. TSP OFF Idle Speed

- A. With the engine idling and the transmission selector in Neutral/Park, collapse the solenoid plunger by forcing the throttle lever pad against the plunger.
- B. Measure the TSP OFF idle speed and compare to specification as listed on Vehicle Emissions Control Information Decal. If the engine speed is not within specification, adjust the throttle adjusting screw until the specified engine speed is obtained.

V. Post Adjustment Instructions

- A. Remove the slave manifold vacuum hose from the engine and connect the decel throttle control vacuum hose to the diaphragm.
- B. Reinstall the air cleaner assembly and reconnect vacuum hose(s).
- C. Recheck curb idle speed. Adjust if not to specifications.
NOTE: Final curb idle speed must be taken with the air cleaner assembly installed.
- D. Stop the engine. Remove all test equipment and tighten the air cleaner wing nut(s) to specification.

7.5L (460 CID) WITH HOLLEY 4180-C (TRUCKS OVER 8500 GVW) (INCLUDES DECEL THROTTLE CONTROL SPEEDS WHEN APPLICABLE)

I. Pre-Adjustment Instructions

- A. Apply parking brake and block the wheels.
- B. Turn off all accessories. Disengage all power take-off units, if so equipped.

- C. With transmission in Neutral (M/T) or Park (A/T), start the engine. Run the engine until normal operating temperature is reached, and then, stop the engine.
- D. Remove the air cleaner assembly and plug the vacuum hose(s) to the assembly.
- E. Check throttle and choke linkages for freedom of movement. Correct as required.
- F. Disconnect system vacuum hose to the decel throttle control diaphragm and plug the hose.
- G. If so equipped, disconnect the fuel evaporative purge valve signal vacuum line as follows: Trace the purge valve vacuum line from the purge valve (located on the canister), to the first point where the vacuum line can be detached from the underhood hose routing e.g.: vacuum "tee" connection, etc. Disconnect the vacuum line at that point, cap the open port, and plug the vacuum line.

CAUTION: To prevent damage to the purge valve, do not disconnect the vacuum line at the purge valve.

- H. Connect a tachometer.

II. Fast Idle Speed

- A. If the engine is equipped with a spark delay valve, remove the delay valve and install a jumper vacuum hose between the remaining vacuum hose ends.
- B. Disconnect the EGR vacuum hose at the EGR valve and plug the hose.
- C. With the engine at normal operating temperature and choke plate fully open, check fast idle speed as follows:

NOTE: Before each speed check, run engine at approximately 2500 rpm for 15 seconds in Neutral/Park.

- 1. Depress the throttle lever and manually rotate the fast idle cam until the fast idle adjusting screw rests on the specified step of the cam. (Refer to the Vehicle Emission Control Information Decal for specified cam setting and idle speed).
- 2. Check fast idle speed and compare to specification. If necessary, adjust the fast idle speed adjusting screw.
- 3. Repeat Steps 1 and 2 until specified fast idle speed can be repeated.
- D. If the spark delay valve was removed, detach the jumper vacuum hose and reinstall the delay valve, making sure the white side of the delay valve faces the distributor advance unit.
- E. Reconnect the EGR vacuum hose at the EGR valve.

III. Curb Idle and Decel Throttle Control Speeds

- A. On engines equipped with a decel throttle control diaphragm, check the curb idle and decel throttle control engine speeds as follows:
- B. Check the curb idle speed as follows:
 1. Run the engine at approximately 2500 rpm for 15 seconds and then allow engine to return to curb idle.
 2. Allow the engine to stabilize and compare curb idle engine speed to specification as listed on

the Vehicle Emission Control Information Decal. If engine speed is not within specification adjust the curb idle speed by rotating the throttle adjusting screw until the specified curb idle speed is obtained.

3. Repeat Steps 1 and 2 until the specified curb idle speed is repeatable.
- C. On engines equipped with decel throttle control diaphragm check the decel throttle control engine speed as follows:
 1. Make sure the curb idle speed is adjusted to specification in accordance with Step B.
 2. Connect a slave vacuum hose from an engine manifold source to the diaphragm.
 3. With the transmission selector in Neutral/Park, run the engine at approximately 2500 rpm for 15 seconds. Then, release the throttle.
 4. Allow one (1) minute for the engine speed to stabilize; then compare the engine speed to specification. (Refer to the Vehicle Emission Control Information Decal). If the engine speed is not to specification, adjust the diaphragm positioner by loosening the lock nut on the positioner and rotate the positioner until the specified engine speed is obtained. Retighten the lock nut.
 5. Allow the engine to return to curb idle speed by disconnecting the slave manifold vacuum hose from the diaphragm and plugging the hose.
 6. Repeat Steps 1 through 5 until the specified engine speeds are repeatable.

IV. Post Adjustment Instructions

- A. Remove the slave manifold vacuum hose from the engine and reconnect the decel throttle control vacuum hose to the diaphragm.
- B. Reinstall the air cleaner assembly and reconnect vacuum hose(s).
- C. Recheck curb idle speed. Adjust if not to specification.
NOTE: Final curb idle speed must be taken with the air cleaner assembly installed.
- D. Stop the engine. Remove all test equipment and tighten the air cleaner wing nut(s) to specification.

7.8L (477 CID) AND 8.8L (534 CID) WITH 4150 EG-4V HOLLEY (TRUCKS OVER 8500 GVW) (INCLUDES DECEL THROTTLE CONTROL SPEEDS WHEN APPLICABLE)

I. Pre-Adjustment Instructions

- A. Apply parking brake and block the wheels.
- B. Turn off all accessories. Disengage all power take-off units, if so equipped.
- C. With transmission in Neutral (M/T) or Park (A/T), start the engine. Run the engine until normal operating temperature is reached, and then, stop the engine.
- D. Remove the air cleaner assembly and plug the vacuum hose(s) to the assembly.
- E. Check throttle and choke linkages for freedom of movement. Correct as required.

- F. Disconnect system vacuum hose to the decel throttle control diaphragm and plug the hose.
- G. If so equipped, disconnect the fuel evaporative purge valve signal vacuum line as follows: Trace the purge valve vacuum line from the purge valve (located on the canister), to the first point where the vacuum line can be detached from the underhood hose routing, e.g.: vacuum "tee" connection, etc. Disconnect the vacuum line at that point, cap the open port, and plug the vacuum line.
CAUTION: To prevent damage to the purge valve, do not disconnect the vacuum line at the purge valve.
- H. Connect a tachometer.

II. Fast Idle Speed

NOTE: To adjust the fast idle speed screw on the 4150-G carburetors use Kent-Moore Tool No. J-10176-K, or equivalent.

- A. With the engine at normal operating temperature and choke plate fully open, check fast idle speed as follows:
NOTE: Before each speed check, run engine at approximately 2500 rpm for 15 seconds in Neutral/Park.
 1. Pull choke control to full choke position. Choke plate should be closed.
 2. Insert a 0.375 in. gauge between choke plate and air horn in the down-stream side of the choke plate.
 3. With gauge in place, as described above, check fast idle speed. If necessary, adjust fast idle speed to specification as listed on the Vehicle Emission Control Information Decal, using the fast idle adjusting screw.
 4. Return choke control to choke OFF position.
 5. Repeat Steps 1-4 until the specified fast idle speed can be repeated.

III. Curb Idle and Decel Throttle Control Speeds

- A. Check the decel throttle control engine speed as follows: Disconnect the vacuum hose from the decel throttle control diaphragm and plug the hose.
 1. Connect a slave vacuum hose from an engine manifold vacuum source to the decel throttle control diaphragm.
 2. Run the engine at approximately 2500 rpm for 15 seconds; then release the throttle.
 3. Allow one (1) minute for the engine speed to stabilize. Then compare engine speed to specification listed on the Vehicle Emission Control Information Decal. If engine speed is not to specification, adjust the solenoid positioner by rotating the screw in the diaphragm housing until the specified engine speed is obtained.
 4. Allow the engine to return to curb idle speed by disconnecting the slave manifold vacuum hose from the diaphragm and plugging the hose.

- B. Check the curb idle speed as follows:
1. Run the engine at approximately 2500 rpm for 15 seconds and then allow engine to return to curb idle.
 2. Allow the engine speed to stabilize and compare curb idle engine speed to the specification listed on the Vehicle Emission Control Information Decal. If the engine speed is not within specification, adjust the curb idle speed adjusting screw until specified engine speed is obtained.
 3. Repeat Steps 1 and 2 until the specified curb idle speed is repeatable.

V. Post Adjustment Instructions

- A. Remove the slave manifold vacuum hose from the engine and reconnect the decel throttle control vacuum hose to the diaphragm.
- B. Reinstall the air cleaner assembly and reconnect vacuum hose(s).
- C. Recheck curb idle speed. Adjust if not to specification.
NOTE: Final curb idle speed must be taken with the air cleaner assembly installed.
- D. Stop the engine. Remove all test equipment and tighten the air cleaner wing nut(s) to specification.

CHOKE SYSTEMS

D-3: AUTOMATIC CHOKE SYSTEM—4.9L (300 CID) ENGINE WITH CARTER YFA-IV (TRUCKS UNDER 8500 GVW) (HOT AIR WITH ELECTRIC ASSIST) CARBURETOR

A. Pre-Check Instructions

1. Apply parking brake and block the wheels.
2. Start the engine, bring to normal operating temperature, and turn off.
3. Remove the air cleaner assembly and plug the vacuum hose(s) to the air cleaner.

B. Freedom of Linkage and System Integrity Check

1. Verify that all vacuum hoses and solenoid wires are properly connected and intact; correct as required. Check torque of carburetor hold-down nuts; tighten to specification, if necessary.
2. Verify that the choke cap index mark points to the specified mark on the choke housing; correct if required. Refer to the Vehicle Emission Control Information Decal or the Truck Performance Specifications Book for the choke setting specification.
3. Check all carburetor linkages for freedom of operation as follows:
 - a. Manually depress the throttle lever to 1/4 open position and rotate the choke plate to the closed position. Release the choke plate; the choke plate should rotate smoothly to the open position. If sticking or binding is exhibited, clean/repair/replace/adjust the choke linkage, as required, to restore freedom of choke plate movement. If necessary, bring engine to normal operating temperature and recheck linkage freedom.

C. Electric Choke Functional Test

1. To set the choke on high cam, depress the throttle lever to the 1/4 open position and then push the choke plate completely closed. While holding the choke plate closed, release the throttle lever; then release the choke plate.
2. Remove the hot air supply tube at the choke housing. Connect a choke port adaptor and choke tester (Rotunda No. LRE-34618 or equivalent) to the choke hot air inlet port. Follow

the choke tester manufacturer's instructions for connecting the tester.

3. Cool the choke housing following the choke tester manufacturer's instructions **except** as follows:
 - a. Do not use the manufacturer's choke come-off time specifications if supplied with tester kit.
 - b. Turn off choke tester or inlet valve momentarily at 15 second intervals until the bi-metal closes and seats the choke plate lightly in the air horn.
4. Remove the choke tester from the choke hot air inlet port adaptor. **Leave the adaptor open (unplugged).**
5. Any time the choke is cooled using a choke tester, conduct the cap continuity test.

6. Cap Continuity Test

- a. Engine off, air cleaner removed: Disconnect the choke wire and connect one lead of a test light to the choke cap terminal and touch the other lead to the positive post of the battery. If the light glows—choke cap contacts are closed. Remove test light and leads, reconnect the choke wire.
 - b. If the test light does not glow: Place an external heat source against the center of the choke cap (i.e.: 100 W lighted extension light) and hold the test light lead to the positive terminal of the battery until the test light glows, indicating the choke cap contacts are closed; quickly remove the heat source and test light connections. If after several minutes the light does not glow, replace the choke cap. Re-cool if necessary. Reconnect the choke wire.
7. Move the fast idle cam to the kickdown step to avoid excessive engine speed.
 8. Without touching the throttle, start the engine. Measure the choke plate opening to the stop.
 - a. Choke plate rotation time is measured from engine start-up until the choke plate reaches the stop in the vertical position.
 - b. If the choke come-off time meets the specification in the Truck Performance Specification Book, allow the engine to return to curb idle speed. Turn the engine off, and proceed to Step d. below.

- c. If the choke come-off time does **not** meet the specification in the Truck Performance Specification Book, allow the engine to return to curb idle speed. Turn the engine off, remove the choke tester adaptor and reinstall the choke hot air supply tube and proceed to Step 9, "Choke Circuit Test."

- d. Remove the choke tester adaptor and reinstall the choke hot air supply tube, torque to specifications.

CAUTION: Use extreme care when removing and reinstalling the choke hot air supply tube to prevent cross-threading and thread damage. Then proceed to Section "D, Choke Heat System Linkage and Flow with Flow Meter."

9. Choke Circuit Test

- a. Disconnect the stator lead at the choke and connect a test light in series with the stator lead wire and ground. With the engine running, if the light glows, replace the choke cap.
- b. If the light does not glow, by-pass the stator lead wire and connect the test light in series with the alternator stator terminal and ground. If the light glows, repair or replace the stator lead wire. If the light does not glow, repair the alternator as required.
- c. Stop the engine, remove the test light, reinstall the stator lead wire.

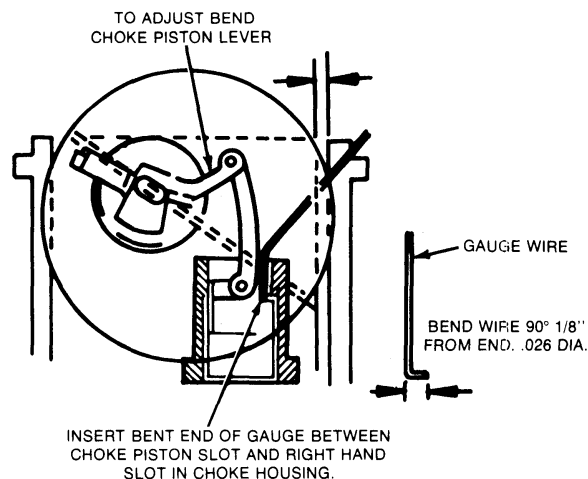
D. Choke Heat System Leakage and Flow with Flow Meter

1. Connect Flow Meter T75L-9850-A or equivalent to choke cold air supply tube. (Use a 9/32 in. ID (minimum) adaptor between the choke tester and the cold air supply tube).
2. Warm engine to normal operating temperature and at curb idle, observe flow meter reading.
3. If flow meter reading is within the specification in the Truck Performance Specification Book, remove the flow meter, connect the choke cold air supply tube and proceed to Section E, "Carburetor Choke Adjustments."
4. If flow meter reading is not within specification, clean, repair, or replace as required to meet the specification in the Truck Performance Specifications Book. Remove flow meter, connect the choke cold air supply tube and proceed to Section E, "Carburetor Choke Adjustments."

E. Carburetor Choke Adjustments

1. Choke Plate Pulldown

- a. Remove the air cleaner assembly, then remove the choke thermostatic spring housing and gasket.
- b. Bend a 0.026 in. diameter wire gauge at a 90 degree angle approximately 1/8 inch from one end. Insert the bent end of the gauge between the choke piston slot and the right hand slot in the choke housing. Rotate the choke piston lever counter-clockwise until the gauge is shut in the piston slot. (Fig. 11).
- c. Exert a light pressure on the choke piston lever to hold the gauge in place, then use a drill with a diameter equal to the specified pulldown



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FIG. 11 Choke Plate Pulldown—Carter YFA-IV Carburetor

clearance between the lower edge of the choke plate and the carburetor bore to check clearance.

- d. To adjust the choke plate pulldown clearance, bend the choke piston lever as required to obtain the setting Specified in the Truck Performance Specifications Book. When bending the lever, be careful not to distort the piston link.
 - e. Install the choke thermostatic spring housing and gasket. Set the housing to the specification shown in the Truck Performance Specifications book.
- #### 2. Dechoke
- a. Remove the air cleaner.
 - b. Hold the throttle plate fully open and close the choke plate as far as possible without forcing it. Use a drill of the proper diameter to check the clearance between the choke plate and the carburetor bore (Fig. 12).
 - c. If the clearance is not within the specification in the Truck Performance Specification Book, adjust by bending the arm on the choke trip tang of the throttle lever (Fig. 12). Bending the arm downward will decrease the clearance, bending it upward will increase the clearance. Always recheck the clearance after making any adjustment.
 - d. If the choke plate clearance and fast idle cam linkage adjustment were performed with the carburetor on the engine, adjust the engine idle speed per Procedure D-2 for the Carter YFA-IV carburetor.

3. Fast Idle Cam Index Setting

- a. Position the fast idle screw on the kickdown step of the fast idle cam against the shoulder of the high step (Fig. 13).
- b. Adjust by bending the choke plate connecting rod to obtain the specified clearance (refer to the Truck Performance Specifications Book), between the lower edge of the choke plate and the carburetor bore (Fig. 13).

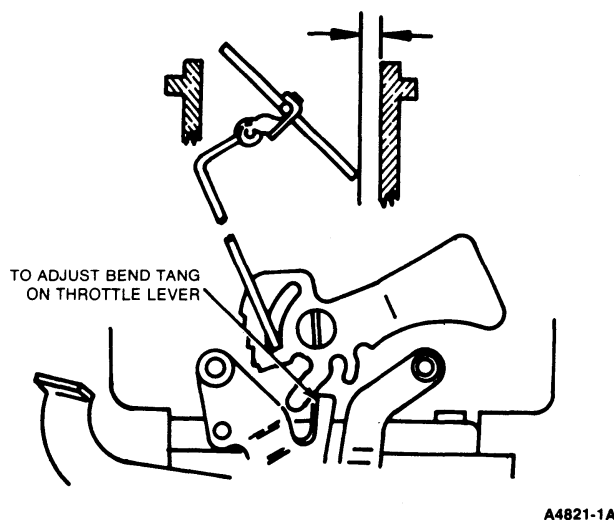


FIG. 12 Dechoke—Carter YFA-IV (Hot Air With Electric Assist) Carburetor

F. Post-Check Instructions

1. Reinstall air cleaner assembly and reconnect vacuum lines. Tighten air cleaner wing nut to specification.

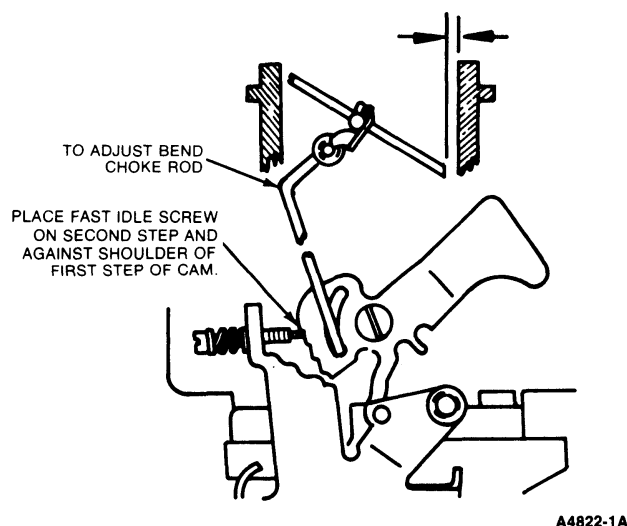


FIG. 13 Fast Idle Cam Index Setting—Carter YFA-IV (Hot Air With Electric Assist) Carburetor

D-3: AUTOMATIC CHOKE SYSTEM—CARTER YFA-IV (HOT AIR) CARBURETOR (TRUCKS OVER 8500 GVW)

A. Pre-Check Instructions

1. Apply parking brake and block tie wheels.
2. Start the engine, bring to normal operating temperature and turn off.
3. Remove the air cleaner assembly and plug the vacuum hose(s) to the air cleaner.

B. Freedom of Linkage and System Integrity Check

1. Verify that all vacuum hoses and solenoid wires are properly connected and intact; correct as

required. Check torque of carburetor hold-down nuts; tighten to specification, if necessary.

2. Verify that the choke cap index mark points to the specified mark on the choke housing; correct if required. Refer to the Vehicle Emission Control Information Decal or Truck Performance Specifications Book for the choke setting specification.
3. Check for carburetor linkages for freedom of operation as follows:
 - a. Manually depress the throttle lever to 1/4 open position and rotate the choke plate to the closed position. Release the choke plate; the choke plate should rotate smoothly to the open position. If sticking or binding is exhibited, clean/repair/replace/adjust the choke linkage, as required, to restore freedom of choke plate movement. If necessary, bring engine to normal operating temperature and recheck linkage freedom.

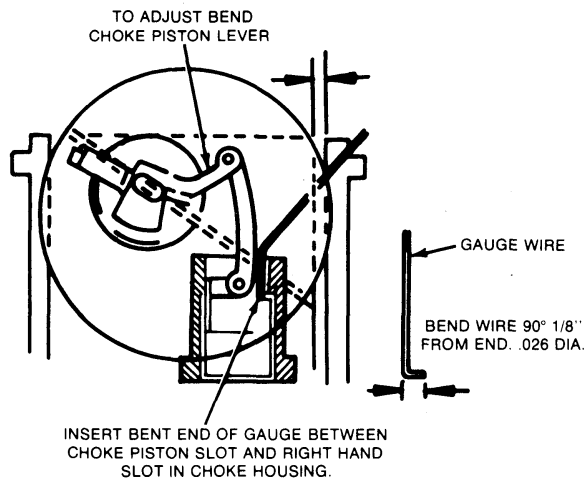
C. Choke Heat System Leakage and Flow with Flow Meter

1. Connect Flow Meter T75L-9850-a or equivalent to choke cold air supply tube. (Use a 9/32 in. ID (minimum) adaptor between the choke tester and the cold air supply tube).
2. Warm engine to normal operating temperature and at curb idle, observe flow meter reading.
3. If flow meter reading is within the specification in the Truck Performance Specification Book, remove the flow meter, connect the choke cold air supply tube and proceed to Section D, "Carburetor Choke Adjustment."
4. If flow meter reading is not within specification, clean, repair, or replace as required to meet specification shown in the Truck Performance Specifications Book. Remove flow meter, connect the choke cold air supply tube and proceed to Section D, "Carburetor Choke Adjustments."

D. Carburetor Choke Adjustments

1. Choke Plate Pulldown

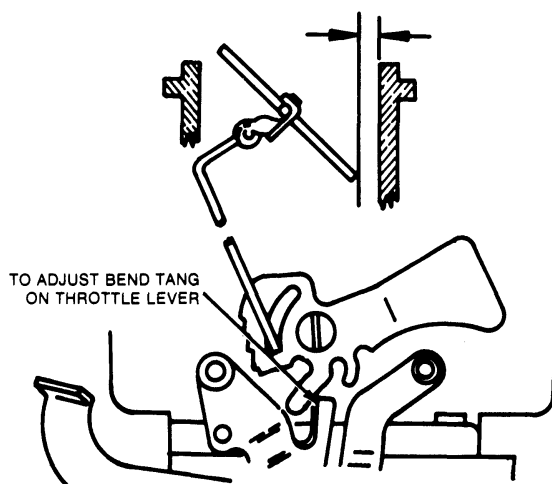
- a. Remove the air cleaner assembly, then remove the choke thermostatic spring housing and gasket.
- b. Bend a 0.026" diameter wire gauge at a 90 degree angle approximately 1/8" from one end. Insert the bent end of the gauge between the choke piston slot and the right hand slot in the choke housing. Rotate the choke piston lever counter-clockwise until the gauge is shut in the piston slot (Fig. 14).
- c. Exert a light pressure on the choke piston lever to hold the gauge in place, then use a drill with a diameter equal to the specified pulldown clearance between the lower edge of the choke plate and the carburetor bore to check clearance.
- d. To adjust the choke plate pulldown clearance, bend the choke piston lever as required to obtain the setting specified in the Truck Performance Specifications Book. When bending the lever, be careful not to distort the piston link.



A4800-1A

FIG. 14 Choke Plate Pulldown—Carter A4800-1A YFA-IV (Hot Air) Carburetor

- e. Install the choke thermostatic spring housing and gasket. Set the housing to the specification shown in the Truck Performance Specifications Book.
- 2. Dechoke**
 - a. Remove the air cleaner.
 - b. Hold the throttle plate fully open and close the choke plate as far as possible without forcing it. Use a drill of the proper diameter to check the clearance between the choke plate and the air horn (Fig. 15).
 - c. If the clearance is not within the specification in the Truck Performance Specifications Book, adjust by bending the arm on the choke trip tang of the throttle lever (Fig. 17). Bending the arm downward will decrease the clearance, and bending it upward will increase the clearance. Always recheck the clearance after making any adjustment.



A4821-1A

FIG. 15 Dechoke—Carter YFA-IV (Hot Air) Carburetor

- d. If the choke plate clearance and fast idle cam linkage adjustment were performed with the carburetor on the engine, adjust the engine idle speed. Adjust the dash pot (if so equipped).

3. Fast Idle Cam Index Setting

- a. Position the fast idle screw on the kickdown step of the fast idle cam against the shoulder of the high step (Fig. 16).
- b. Adjust by bending the choke plate connecting rod to obtain the specified clearance (refer to the Truck Performance Specifications Book), between the lower edge of the choke plate and the carburetor bore (Fig. 16).

E. Post-Check Instructions

Reinstall air cleaner assembly and reconnect all vacuum lines. Tighten air cleaner wing nut to specification.

D-3: AUTOMATIC CHOKE SYSTEM—MOTORCRAFT 2150-2V (HOT AIR WITH ELECTRIC ASSIST) CARBURETOR (TRUCKS UNDER 8500 GVW)

A. Pre-Check Instructions

1. Apply parking brake and block the wheels.
2. Start the engine, bring to normal operating temperature and turn off.
3. Remove the air cleaner assembly and plug the vacuum hose(s) to the air cleaner.

B. Freedom of Linkage and System Integrity Check

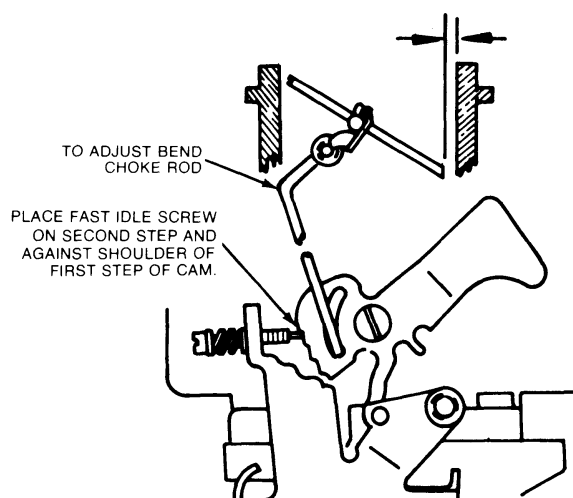
1. Verify that all vacuum hoses and solenoid wires are properly connected and intact; correct as required. Check torque of carburetor hold-down nuts; tighten to specification, if necessary.
2. Verify that the choke cap index mark points to the specified mark on the choke housing; correct if required. Refer to the Vehicle Emission Control Information Decal or Truck Performance Specification Book for the choke setting specification.
3. Check all carburetor linkages for freedom of operation as follows:
 - a. Manually depress the throttle lever to 1/4 open position and rotate the choke plate to the closed position. Release the choke plate; the choke plate should rotate smoothly to the open position. If sticking or binding is exhibited, clean/repair/replace/adjust the choke linkage, as required, to restore freedom of choke plate movement. If necessary, bring engine to normal operating temperature and recheck linkage freedom.

C. Electric Choke Functional Test

1. Insert a 1/2" diameter drill between the lower edge of the choke plate and the air horn wall in the center of the carburetor. Mark the position of the choke plate on the inside of the air horn. Remove the drill and set the fast idle cam on the highest step.
2. Remove the hot air supply tube at the choke housing. Connect a choke port adaptor and choke tester (Rotunda No. LRE-34618 or

equivalent) to the choke hot air inlet port. Follow the choke tester manufacturer's instructions for connecting the tester.

3. Cool the choke housing following the choke tester manufacturer's instructions **except** as follows:



A4822-1A

FIG. 16 Fast Idle Cam Index Setting—Carter YFA-IV (Hot Air) Carburetor

- a. Do not use the manufacturer's choke come-off time specifications if supplied with tester kit.
- b. Before activating the choke tester, manually retract the positive choke closure spring (external spring on pulldown motor) if equipped, and secure it in the retracted position with an alligator clip.
- c. Turn off choke tester or inlet valve momentarily at 15 second intervals until the bi-metal closes and seats the choke plate lightly in the air horn. Remove all alligator clips.
4. Remove the choke tester from the choke hot air inlet port adaptor and install a plug or cap on the adaptor.
5. Any time the choke is cooled using a choke tester, conduct the cap continuity test.
6. **Cap Continuity Test**
 - a. Engine off, air cleaner removed: Disconnect the choke wire and connect one lead of a test light to the choke cap terminal and touch the other lead to the positive post of the battery. If the light glows—choke cap contacts are closed. Remove test light and leads, reconnect the choke wire.
 - b. If the test light does not glow: Place an external heat source against the center of the choke cap (i.e.: 100 W lighted extension light) and hold the test light lead to the positive terminal of the battery until the test light glows, indicating the choke cap contacts are closed; quickly remove the heat source and test light connections. If after several minutes the light does not glow, replace the choke cap. Re-cool if necessary. Reconnect the choke wire.
7. Move the fast idle cam to the kickdown step to avoid excessive engine speed.

8. Without touching the throttle, start the engine. Measure the choke plate rotation time.
 - a. Choke plate rotation time is measured from engine start-up until the choke plate reaches the reference mark in the air horn.
 - b. If the choke rotation time meets the specification in the Truck Performance Specifications Book, allow the engine to return to curb idle speed. Turn the engine off, and proceed to Step d. below.
 - c. If the choke come-off time does **not** meet the specification in the Truck Performance Specifications Book, allow the engine to return to curb idle speed. Turn the engine off and proceed to Step 9, "Choke Circuit Test."
 - d. Remove the choke tester adaptor and reinstall the choke hot air supply tube.

CAUTION: Use extreme care when removing and reinstalling the choke hot air supply tube to prevent cross-threading and thread damage. Then proceed to Section "D, Choke Heat System Linkage and Flow with Flow Meter."

9. Choke Circuit Test

- a. Disconnect the stator lead at the choke and connect a test light in series with the stator lead wire and ground. With the engine running, if the light glows, replace the cap. Proceed to Step c. below.
- b. If the light does not glow, by-pass the stator lead wire and connect the test light in series with the alternator stator terminal and ground. If the light glows, repair or replace the stator lead wire. If the light does not glow, repair the alternator as required. Proceed to Step below.
- c. Stop the engine, remove the test light, reinstall the stator lead wire.
- d. Proceed to Step C-3 "Electric Choke Functional Test."

D. Choke Heat System Leakage and Flow with Flow Meter

1. Connect Flow Meter T75L-9850-A or equivalent to choke cold air supply tube. (Use a 9/32 in. ID (minimum) adaptor between the choke tester and the cold air supply tube).
2. Warm engine to normal operating temperature, and at curb idle, observe flow meter reading in Drive or Neutral.
3. If flow meter reading is within the specification in the Truck Performance Specifications Book, remove the flow meter, connect the choke cold air supply tube and proceed to Section "F, Choke Vacuum Circuit."
4. If flow meter reading is not within specification, clean, repair, or replace as required to meet the specification in the Truck Performance Specifications Book. Remove flow meter, connect the choke cold air supply tube and proceed to Section "F, Choke Vacuum Circuit."

E. Choke Vacuum Circuit

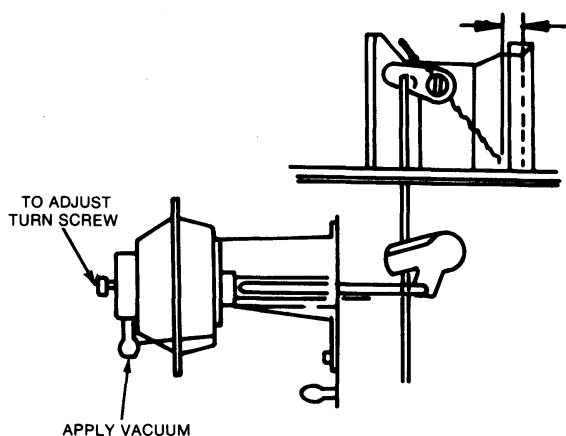
1. Remove the vacuum line to the choke pulldown motor and apply an external vacuum source to the pulldown motor.

- a. If the pulldown motor activates, proceed to Step 2 below.
- b. If the pulldown motor does not activate, replace the pulldown motor and proceed to Step 2 below.
2. Apply a vacuum source to the hose end.
 - a. If vacuum holds, clean as required.
 - b. If vacuum does not hold, proceed to Section "F. Carburetor Choke Adjustments."

F. Carburetor Choke Adjustments

1. Choke Plate Pulldown

- a. Rotate the choke thermostatic housing, counter-clockwise to lightly close the choke plate; and then an additional 90 degrees.
 - b. Activate the pulldown motor by applying an external vacuum source or by manually forcing the diaphragm to the retracted position.
 - c. Using a drill of the specified size, measure the clearance between the lower edge of the choke plate and the air horn wall. (Fig. 17). Refer to the Truck Performance Specifications Book for the pulldown setting specification. Remove or allow clearance for flashing on air horn wall.
 - d. Apply heat to the base of the pulldown motor adjusting screw, using a soldering gun, until the adjusting screw will easily turn. Turn the adjusting screw back and forth, about half a turn, a number of times to break up the Loctite. When the adjusting screw is loose, remove the adjusting screw and clean off the Loctite that has remained on the threads. Reinstall the adjusting screw and adjust. Turn the adjusting screw clockwise to decrease the pulldown or counter-clockwise to increase.
 - e. After adjustment, Loctite must be applied (use Loctite 290 or equivalent) to the base of the positioned adjusting screw to lock it in place.
- NOTE: After each pulldown adjustment, it is necessary to check the fast idle cam setting.**

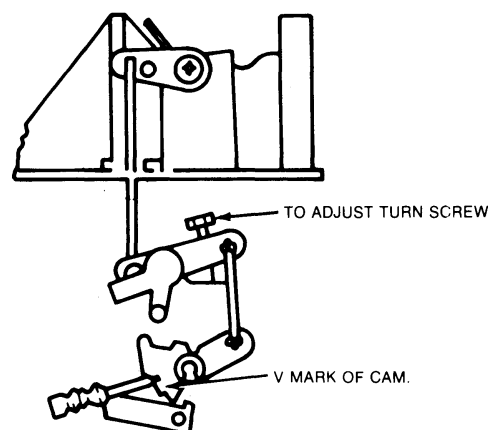


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FIG. 17 Choke Plate Pulldown—Motorcraft 2150-2V (Hot Air with Electric Assist) Carburetor

2. Fast Idle Cam Set

- a. With the choke thermostatic housing still in the rich position, cycle the throttle to set the fast idle cam.
- b. Activate the choke pulldown mechanism as in the pulldown setting procedure.
- c. Cycle the throttle and observe the fast idle cam; it should drop to the kickdown step and the fast idle screw should be opposite the "V" notch on the cam (Fig. 18).



A4827-1A

FIG. 18 Fast Idle Cam Setting—Motorcraft 2150-2V (Hot Air with Electric Assist) Carburetor

- d. To adjust, turn the screw in the fast idle cam lever.
- e. Reconnect the vacuum hose to the pulldown motor.
3. Dechoke
 - a. Hold the throttle in the wide open position.
 - b. Using the proper size drill, measure the clearance between the lower edge of the choke plate and the air horn wall (Fig. 19). Refer to the Truck Performance Specifications Book for specification.
 - c. To adjust, bend the tang on the fast idle lever (Fig. 19).
 - d. Reset the choke thermostat housing to specification.

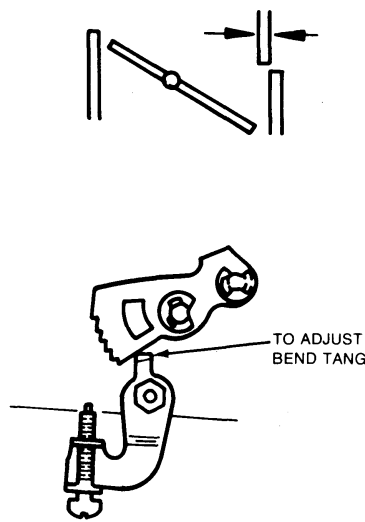
G. Post-Check Instructions

Reinstall air cleaner assembly and reconnect all vacuum lines. Tighten air cleaner wing nut to specification.

D-3: AUTOMATIC CHOKE SYSTEM—MOTORCRAFT 2150-2V (HOT AIR ONLY) CARBURETOR

A. Pre-Check Instructions

1. Apply parking brake and block the wheels.
2. Start the engine, bring to normal operating temperature and turn off.



A4828-1A

FIG. 19 Dechoke—Motorcraft 2150-2V (Hot Air with Electric Assist) Carburetor

3. Remove the air cleaner assembly and plug the vacuum hose(s) to the air cleaner.
- B. Freedom of Linkage and System Integrity Check**
 1. Verify that all vacuum hoses and solenoid wires are properly connected and intact; correct as required. Check torque of carburetor hold-down nuts; tighten to specification, if necessary.
 2. Verify that the choke cap index mark points to the specified mark on the choke housing; correct if required. Refer to the Vehicle Emission Control Information Decal or Truck Performance Specifications Book for the choke setting specification.
 3. Check all carburetor linkages for freedom of operation as follows:
 - a. Manually depress the throttle lever to 1/4 open position and rotate the choke plate to the closed position. Release the choke plate; the choke plate should rotate smoothly to the open position. If sticking or binding is exhibited, clean/repair/replace/adjust the choke linkage, as required, to restore freedom of choke plate movement. If necessary, bring engine to normal operating temperature and recheck linkage freedom.
- C. Choke Heat System Leakage and Flow with Flow Meter**
 1. Connect Flow Meter T75L-9850-A or equivalent to choke cold air supply tube. (Use a 9/32 in. ID (minimum) adaptor between the choke tester and the cold air supply tube).
 2. Warm engine to normal operating temperature and at curb idle, observe flow meter reading.
 3. If flow meter reading is within the specification in the Truck Performance Specifications Book, remove the flow meter, connect the choke cold air supply tube and proceed to Section "D. Choke Vacuum Circuit."
 4. If flow meter reading is not within specification, clean, repair, or replace as required to meet the specification shown in the Truck Performance

Specifications Book. Remove flow meter, connect the choke cold air supply tube and proceed to Section "D. Choke Vacuum Circuit."

D. Choke Vacuum Circuit

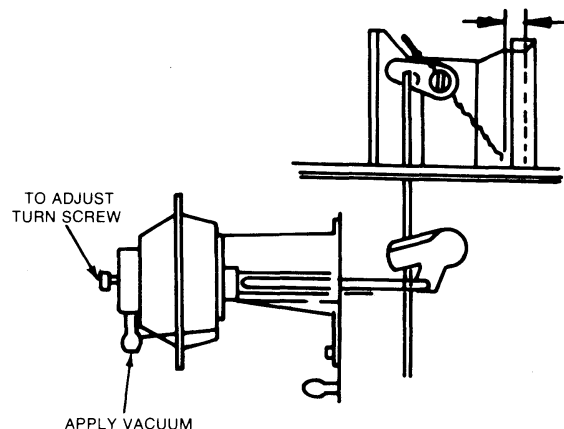
1. Remove the vacuum line to the choke pulldown motor and apply an external vacuum source to the pulldown motor.
 - a. If the pulldown motor activates, proceed to Step 2.
 - b. If the pulldown motor does not activate, replace the pulldown motor and proceed to Step 2.
2. Apply a vacuum source to the hose end.
 - a. If vacuum holds, clean as required.
 - b. If vacuum does not hold, proceed to Section "E. Carburetor Choke Adjustments."

E. Carburetor Choke Adjustments

1. Choke Plate Pulldown

- a. Temporarily rotate the choke thermostatic housing rich to lightly close the choke plate and then an additional 90 degrees.
- b. Activate the pulldown motor by applying an external vacuum source or by manually forcing the diaphragm to the retracted position.
- c. Using a drill of the appropriate size, measure the clearance between the lower edge choke plate and the air horn wall (Fig. 20). Refer to the Truck Performance Specifications Book for the pulldown setting specification. Remove or allow clearance for flashing on air horn wall.
- d. Turn the adjusting screw clockwise to decrease the pulldown or counter-clockwise to increase (Fig. 22).

NOTE: After each pulldown adjustment, it is necessary to check the fast idle cam setting.



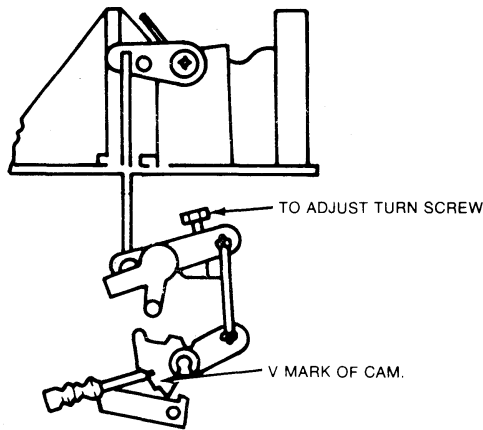
A4826-1A

FIG. 20 Choke Plate Pulldown Setting—Motorcraft 2150-2 (Hot Air Only) Carburetor

2. Fast Idle Cam Set

- a. With the choke thermostatic housing still in the rich position, cycle the throttle to set the fast idle cam.

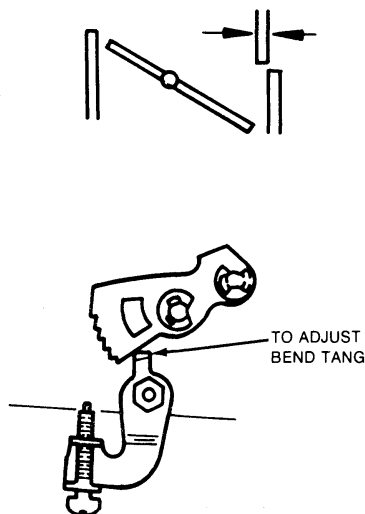
- b. Activate the choke pulldown mechanism as in the pulldown setting procedure.
- c. Cycle the throttle and observe the fast idle cam; it should drop to the kickdown step and the fast idle screw should be opposite the "V" notch on the cam (Fig. 21).



A4827-1A

FIG. 21 Fast Idle Cam Setting—Motorcraft 2150-2V (Hot Air Only) Carburetor

- d. To adjust, turn the screw in the fast idle cam lever.
 - e. Reconnect the vacuum hose to the pulldown motor.
- 3. Dechoke**
- a. Hold the throttle in the wide open position.
 - b. Using the proper size drill, measure the clearance between the lower edge of the choke plate and the air horn wall (Fig. 22).



A4828-1A

FIG. 22 Dechoke—Motorcraft 2150-2V (Hot Air Only) Carburetor

- c. To adjust, bend the tang on the fast idle lever (Fig. 22).

- d. Reset the choke thermostat housing to specification.

F. Post-Check Instructions

Reinstall air cleaner assembly and reconnect all vacuum lines. Tighten air cleaner wing nut to specification.

D-3: AUTOMATIC CHOKE SYSTEM—HOLLEY 4180 C-4V (HOT AIR WITH ELECTRIC ASSIST) CARBURETOR

A. Pre-Check Instructions

1. Apply parking brake and block the wheels.
2. Start the engine, bring to normal operating temperature and turn off.
3. Remove the air cleaner assembly and plug the vacuum hose(s) to the air cleaner.

B. Freedom of Linkage and System Integrity Check

1. Verify that all vacuum hoses and solenoid wires are properly connected and intact; correct as required. Check torque of carburetor hold-down nuts; tighten to specification, if necessary.
2. Verify that the choke cap index mark points to the specified mark on the choke housing; correct if required. Refer to the Vehicle Emission Control Information Decal or Truck Performance Specifications Book for the choke setting specification.
3. Check all carburetor linkages for freedom of operation as follows:
 - a. Manually depress the throttle lever to 1/4 open position and rotate the choke plate to the closed position. Release the choke plate; the choke plate should rotate smoothly to the open position. If sticking or binding is exhibited, clean/repair/replace/adjust the choke linkage, as required, to restore freedom of choke plate movement. If necessary, bring engine to normal operating temperature and recheck linkage freedom.

C. Electric Choke Functional Test

1. Insert a 1/2" diameter drill between the lower edge of the choke plate and the air horn wall in the center of the carburetor. Mark the position of the choke plate on the inside of the air horn. Remove the drill and set the fast idle cam on the highest step.
2. Remove the hot air supply tube at the choke housing. Connect a choke port adaptor and choke tester (Rotunda No. LRE-34618 or equivalent) to the choke hot air inlet port. Follow the choke tester manufacturer's instructions for connecting the tester.
3. Cool the choke housing following the choke tester manufacturer's instructions **except** as follows:
 - a. Do not use the manufacturer's choke come-off time specifications if supplied with tester kit.
 - b. Turn off choke tester or inlet valve momentarily at 15 second intervals until the bi-metal closes and seats the choke plate lightly in the air horn. Remove all alligator clips.

4. Remove the choke tester from the choke hot air inlet port adaptor and install a plug or cap on the adaptor.
5. Any time the choke is cooled using a choke tester, conduct the cap continuity test.

6. Cap Continuity Test

- a. Engine off, air cleaner removed: Disconnect the choke wire and connect one lead of a test light to the choke cap terminal and touch the other lead to the positive post of the battery. If the light glows—choke cap contacts are closed. Remove test light and leads, reconnect the choke wire.
- b. If the test light does not glow: Place an external heat source against the center of the choke cap (i.e.: 100 W lighted extension light) and hold the test light lead to the positive terminal of the battery until the test light glows, indicating the choke cap contacts are closed; quickly remove the heat source and test light connections. If after several minutes the light does not glow, replace the choke cap. Re-cool if necessary. Reconnect the choke wire.
7. Move the fast idle cam to the kickdown step to avoid excessive engine speed.
8. Without touching the throttle, start the engine. Measure the choke plate rotation time.
 - a. Choke plate rotation time is measured from engine start-up until the choke plate reaches the reference mark in the air horn.
 - b. If the choke rotation time meets the specification listed in the Truck Performance Specifications Book, allow the engine to return to curb idle speed. Turn the engine off, and proceed to Step d. below.
 - c. If the choke come-off time does not meet the specification in the Truck Performance Specifications Book, allow the engine to return to curb idle speed. Turn the engine off and proceed to Step 9, "Choke Circuit Test."
 - d. Remove the choke tester adaptor and reinstall the choke hot air supply tube.

CAUTION: Use extreme care when removing and reinstalling the choke hot air supply tube to prevent cross-threading and thread damage. Then proceed to Section "D, Choke Heat System Linkage and Flow with Flow Meter."

9. Choke Circuit Test

- a. Disconnect the stator lead at the choke and connect a test light in series with the stator lead wire and ground. With the engine running, if the light glows, replace the choke cap.
- b. If the light does not glow, by-pass the stator lead wire and connect the test light in series with the alternator stator terminal and ground. If the light glows, repair or replace the stator lead wire. If the light does not glow, repair the alternator as required.
- c. Stop the engine, remove the test light, reinstall the stator lead wire.

D. Choke Heat System Leakage and Flow with Flow Meter

1. Connect Flow Meter T75L-9850-A or equivalent to choke cold air supply tube. (Use a 9/32 in. ID (minimum) adaptor between the choke tester and the cold air supply tube).
2. Warm engine to normal operating temperature and at curb idle, observe flow meter reading.
3. If flow meter reading is within the specification in the Truck Performance Specifications Book, remove the flow meter, connect the choke cold air supply tube and proceed to Section "E. Carburetor Choke Adjustments."
4. If flow meter reading is not within specification, clean, repair, or replace as required to meet the specification in the Truck Performance Specifications Book. Remove flow meter, connect the choke cold air supply tube and proceed to Section "E. Carburetor Choke Adjustments."

E. Carburetor Choke Adjustments

1. Choke Plate Pulldown

- a. Remove choke thermostat housing, gasket and retainer.
- b. Insert a piece of wire (Fig. 23), into the choke piston bore to move the piston down against the stop screw. Maintain light closing pressure on the choke plate and measure the gap between the lower edge of the choke plate and the air horn wall. Refer to the Truck Performance Specifications Book for the pulldown setting specification.
- c. To adjust, remove the putty covering the adjustment screw and turn clockwise to decrease or counter-clockwise to increase the gap setting (Fig. 23).
- d. Reinstall the choke thermostatic housing, gasket and retainer. (DO NOT TIGHTEN THE ATTACHING SCREWS AT THIS TIME).

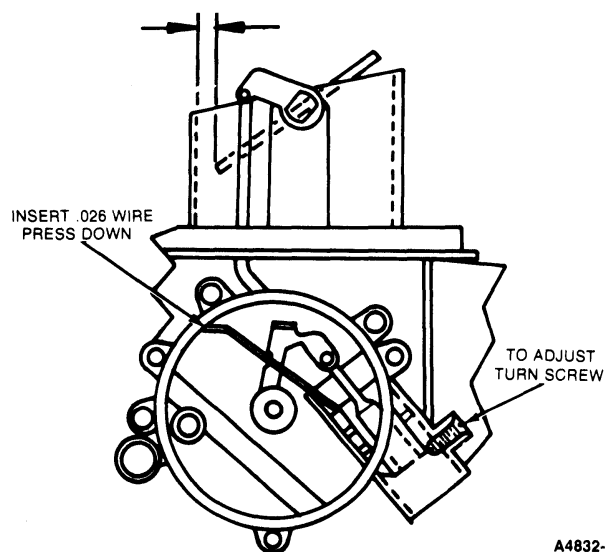


FIG. 23 Choke Plate Pulldown—Holley 4180 C-4V (Hot Air with Electric Assist) Carburetor

2. Fast Idle Cam Set

- Rotate the choke cap 45 degrees counter-clockwise (rich) to close the choke plate. Tighten the attaching screws at this time.
- Open and close the throttle to place the fast idle screw on the top step of the cam (Fig. 24).

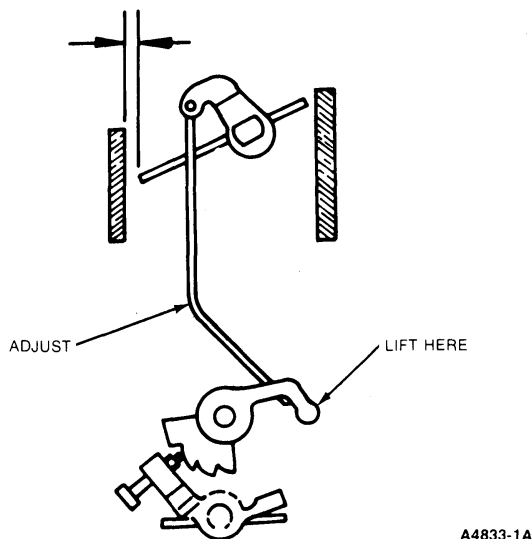


FIG. 24 Fast Idle Cam Setting—Holley 4180 C-4V (Hot Air with Electric Assist) Carburetor

- Place a pulldown gauge between the lower edge of the choke plate and the air horn wall, then open and close the throttle to allow the fast idle cam to drop.
- Press upward on the fast idle cam. There should be little or no movement indicating that the fast idle screw is on the kickdown (2nd) step of the cam, against the first step.
- To adjust, use bending tool and bend the choke control rod to assure proper fast idle screw location on the cam (Fig. 24).
- Loosen screws and reset the choke thermostatic housing to the proper index mark and retighten the retaining screws.

3. Dechoke

- Hold the throttle in the wide open position.
- Apply light closing pressure on the choke plate and measure the gap between the lower edge of the choke plate and the air horn wall (Fig. 25). Refer to the Truck Performance Specifications Book for specification.
- To adjust, bend the pawl on the fast idle lever (Fig. 25).

F. Post-Check Instructions

Reinstall air cleaner assembly and reconnect pertinent vacuum lines. Tighten air cleaner wing nut to specification.

D-3: AUTOMATIC CHOKE SYSTEM—HOLLEY 4180 C-4V (HOT AIR ONLY) CARBURETOR

A. Pre-Check Instructions

- Apply parking brake and block the wheels.

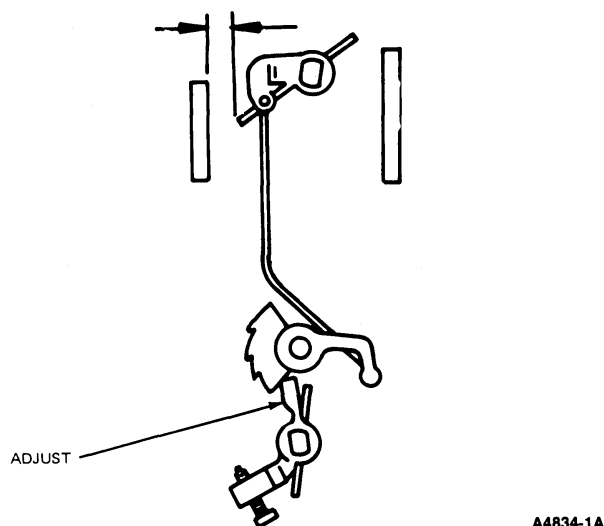


FIG. 25 Dechoke—Holley 4180 C-4V (Hot Air with Electric Assist) Carburetor

- Start the engine, bring to normal operating temperature and turn off.
- Remove the air cleaner assembly and plug the vacuum hose(s) to the air cleaner.

B. Freedom of Linkage and System Integrity Check

- Verify that all vacuum hoses and solenoid wires are properly connected and intact; correct as required. Check torque of carburetor hold-down nuts; tighten to specification, if necessary.
- Verify that the choke cap index mark points to the specified mark on the choke housing; correct if required. Refer to the Vehicle Emission Control Information Decal or Truck Performance Specifications Book for the choke setting specification.
- Check all carburetor linkages for freedom of operation as follows:
 - Manually depress the throttle lever to 1/4 open position and rotate the choke plate to the closed position. Release the choke plate; the choke plate should rotate smoothly to the open position. If sticking or binding is exhibited, clean/repair/replace/adjust the choke linkage, as required, to restore freedom of choke plate movement. If necessary, bring engine to normal operating temperature and recheck linkage freedom.

C. Choke Heat System Leakage and Flow with Flow Meter

- Connect Flow Meter T75L-9850-A or equivalent to choke cold air supply tube. (Use a 9/32 in. ID (minimum) adaptor between the choke tester and the cold air supply tube).
- Warm engine to normal operating temperature and at curb idle, observe flow meter reading.
- If flow meter reading is within the specification in the Truck Performance Specifications Book, remove the flow meter, connect the choke cold air supply tube and proceed to Section "D. Carburetor Choke Adjustments."

4. If flow meter reading is not within specification, clean, repair, or replace as required to meet the specifications shown in the Truck Performance Specifications Book. Remove flow meter, connect the choke cold air supply tube and proceed to Section "D. Carburetor Choke Adjustments."

D. Carburetor Choke Adjustments

1. Choke Plate Pulldown

- a. Remove choke thermostat housing, gasket and retainer.
- b. Insert a piece of wire (Fig. 26) into the choke piston bore to move the piston down against the stop screw. Maintain light closing pressure on the choke plate and measure the gap between the lower edge of the choke plate and the air horn wall. Refer to the Truck Performance Specifications Book for the pulldown setting specification.

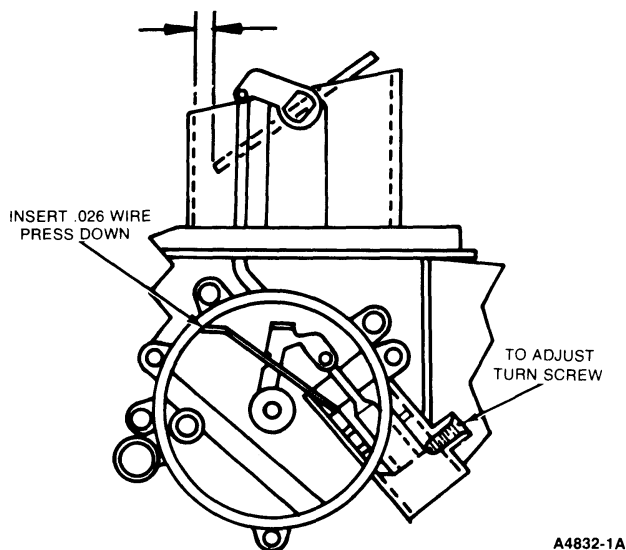


FIG. 26 Choke Plate Pulldown—Holley 4160 C-4V (Hot Air Only) Carburetor

- c. To adjust, remove the putty covering the adjustment screw and turn clockwise to decrease or counter-clockwise to increase the gap setting.
- d. Reinstall the choke thermostatic housing, gasket and retainer. (DO NOT TIGHTEN THE ATTACHING SCREWS AT THIS TIME).

2. Fast Idle Cam Set

- a. Rotate the choke cap 45 degrees counter-clockwise (rich) to close the choke plate. Tighten the attaching screws at this time.
- b. Open and close the throttle to place the fast idle screw on the top step of the cam (Fig. 27).
- c. Place a pulldown gauge between the lower edge of the choke plate and the air horn wall, then open and close the throttle to allow the fast idle cam to drop.
- d. Press upward on the fast idle cam. There should be little or no movement indicating that the fast idle screw is on the kickdown (2nd) step of the cam, against the first step.

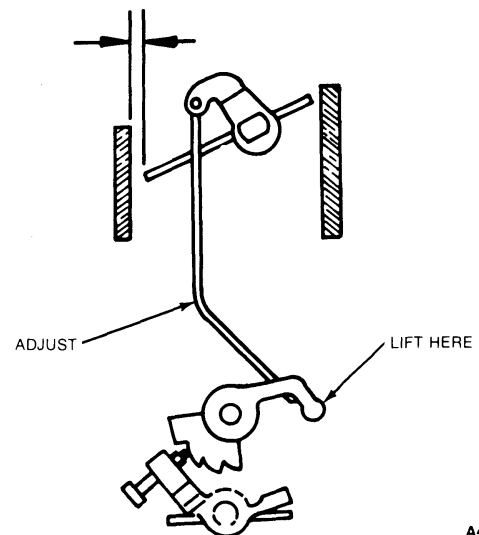


FIG. 27 Fast Idle Cam Set—Holley 4180-C-4V (Hot Air Only) Carburetor

- e. To adjust, use bending tool and bend the choke control rod to assure proper fast idle screw location on the cam.
- f. Loosen screws and reset the choke thermostatic housing to the proper index mark and retighten the retaining screws.

3. Dechoke

- a. Hold the throttle in the wide open position.
- b. Apply light closing pressure on the choke plate and measure the gap between the lower edge of the choke plate and the air horn wall (Fig. 28). Refer to the Truck Performance Specifications Book for specification.
- c. To adjust, bend the pawl on the fast idle lever (Fig. 28).

E. Post-Check Instructions

Reinstall air cleaner assembly and reconnect pertinent vacuum lines. Tighten air cleaner wing nut to specification.

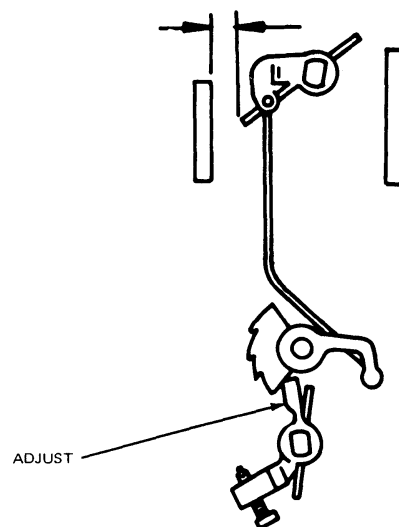


FIG. 28 Dechoke—Holley 4180 C-4V (Hot Air Only) Carburetor

D-3: MANUAL CHOKE CARBURETORS ONLY—HOLLEY 2300-EG, CARTER YFA-IV, HOLLEY 4180-EG, HOLLEY 4150-EG

A. Pre-Check Instructions

1. Apply parking brake and block wheels.
2. Bring engine to normal operating temperature.
3. Turn off the engine.
4. Remove the air cleaner assembly and plug the vacuum line(s) to the air cleaner assembly.
5. Verify that the vacuum hoses and solenoid are properly connected and intact. Check that all carburetor hold down nuts are torqued to specification.
6. Check all carburetor linkages for freedom of operation. Lubricate or repair or replace and adjust as required.
7. Check for freedom of operation of choke plate for closing in the air horn bore, closing of anti-back fire poppets. Correct as required.
8. Check choke plate travel using dashboard control. Choke should close in the air horn bore for full choke and be in the vertical position at choke "OFF". Correct choke cable adjustment, if necessary.

B. Post-Check Instructions

Reinstall the air cleaner assembly and reconnect pertinent vacuum lines. Torque the air cleaner wing nut to specification.

D-3A: AUTOMATIC CHOKE SYSTEM ALL CARBURETORS

A. Carburetor Choke Linkage Cleaning Procedure

1. Remove Choke Cap.
2. Using Rotunda Automatic Choke Cleaner (C9AZ-19A501-B) or equivalent, spray inside of choke cap on and near the bi-metal until all dirt build-up is washed away.
3. **Using the Wand provided with the cleaner**, spray all areas of the choke thermostat shaft inside and out of the choke housing. Also, spray the entire choke linkage external to the carburetor. Use an abundant amount of spray and move the choke thermostat lever, the fast idle lever, and the fast idle cam moderately while spraying.
4. Blow the choke parts previously cleaned with compressed air until visibly dry. Again, move the moveable parts moderately while blowing dry.
5. Repeat Steps 3 and 4.
6. Install choke cap gasket, choke cap (making sure that it is properly indexed) and choke cap retainer ring. (Refer to the Vehicle Emission Control Information Decal for choke cap setting.)

NOTE: California only models are equipped with blind rivets in place of screws to retain the choke cap and must be removed. Re-install the choke cap using 1/8 in. diameter x 1/2 in. long blind rivets.

D-4: CARBURETOR AIR CLEANER ELEMENT AND CRANKCASE EMISSION FILTER

A. Carburetor Air Cleaner Element

1. Remove air cleaner assembly from engine before removing the filter element to prevent inadvertently dropping dirt into the carburetor. Remove any extraneous dust or dirt from carburetor flange area.
2. Inspect inside surfaces of cover and tray for traces of dirt leakage past element as a result of damaged element seals, wrong element usage, or inadequate torque on the wing nut or wing screw.
3. Remove element and clean tray and cover. Install a new element after visual inspection for possible damage in handling (deformed seals or holes in paper).
4. Install air cleaner body on carburetor flange. The air cleaner should seat freely on the carburetor gasket. Visual observation will show if heater hoses or attaching components restrict a good seal to the gasket.
5. Install cover on element and air cleaner body and, when applicable, reinstall the rubber-backed wing nut washer.
6. Reconnect all vacuum or electrical lines. When reconnecting the crankcase closure lines to the air cleaner, be sure the joint between the elbow and filter pack is secure and fully engaged.
7. Install wing nut or wing screw and tighten to specification. On air cleaners using support brackets, always tighten carburetor wing nut before securing support bracket. This will assure air cleaner seal to carburetor and maximum protection against dust leakage to the engine.

B. Crankcase Emission Filter

1. Remove air cleaner cover.
2. Detach the retaining clip from the crankcase filter pack assembly and remove the filter pack assembly from the air cleaner tray.
3. Remove and discard the filter media pad from the filter pack housing. Wash the housing with a suitable solvent. Lightly oil a new filter media pad and install the pad in the housing. (The lamination line of the filter must be visible after installation. Install sponge gasket over male nipple of filter pack housing).
4. Reinstall the filter pack assembly in the air cleaner tray and secure the assembly with the retaining clip.
5. Reinstall the air cleaner cover and, when applicable, the rubber-backed wing nut washer. Install wing nut/screw and tighten to specification.
6. Reconnect the closure line to the filter pack.

D-5: OIL BATH AIR CLEANER—SERVICE

Clean Oil Bath Air Cleaner and Refill Reservoir

1. Remove air cleaner assembly and place it on a work bench.
2. Remove the air cleaner cover and drain the oil from the reservoir. Wash all the air cleaner parts in a

suitable cleaning solvent. Dry all parts with compressed air.

3. Inspect the gasket between the oil reservoir chamber and air cleaner body. Replace as necessary.
4. Fill the oil reservoir to the full mark with the recommended engine oil.
5. Reinstall the air cleaner assembly, making sure that the air cleaner wing nut is tightened to specification.

D-6: FUEL FILTER REPLACEMENT—ALL TYPES

A. Replaceable Cartridge Type (Mounted in Fuel Pump on In-Line Container)

1. Remove loose contaminant(s) from filter case sealing joint area.
2. Remove filter case while supporting in-line filter cover or fuel pump filter adapter in best way possible to prevent damage to connecting parts.
3. Remove and discard filter cartridge and case gasket.
4. Remove loose contaminants from filter case (interior and exterior).
5. Check filter gasket sealing surfaces for gasket residue build-up. Clean as required.
6. Position new recommended filter cartridge over the spout in the filter cover or the fuel pump filter adapter.
7. Position new recommended gasket to filter case and lubricate with clean engine oil.
8. Install filter case, with gasket, to mating cover or adapter and tighten to firm gasket contact plus 1/8 added turn. Check for proper positioning of gasket in case after assembly.
9. Start engine and check for leaks.

B. Fuel Filter Replacement (Chassis Mounted)

1. Remove filter cartridge assembly by unscrewing it from base—discard.
2. Remove any gasket residue build-up from base gasket sealing surface. Also, remove any loose contaminants from area.
3. Lubricate new recommended filter cartridge assembly integral gasket with clean engine oil.
4. Install filter by screwing it into base threaded connector to firm gasket contact plus an added 1/2 to 3/4 turns—**do not** use any tool.
5. Start engine and check for leaks.

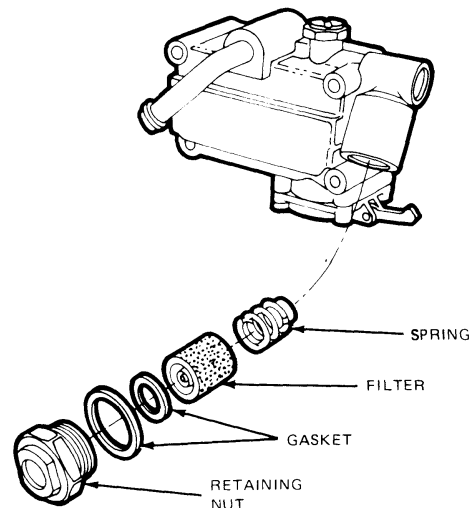
C. Fuel Filter Replacement (In-Line Throw-away Type)

1. Remove the air cleaner.
2. Loosen the retaining clamp securing the fuel filter hose to the fuel filter.
3. Remove and discard the retaining clamps and filter.
4. Install new clamps on the inlet and outlet hoses and connect the hoses to a new filter.
5. Locate the fuel line hose clamps in the proper position and crimp the clamps securely.
6. Start the engine and check for fuel leaks.

7. Reinstall air cleaner and torque air cleaner wing nut to specification.

D. Fuel Filter Replacement (4180-C Holley)

1. Remove the fuel line at the carburetor.
2. Remove the fuel filter retaining nut, gasket, filter gasket, filter and spring (Fig. 29).
3. Discard filter and gaskets.
4. Reinstall spring, filter, gaskets and retaining nut as follows:
 - a. Place new filter gasket in retaining nut recess.
 - b. Place retaining nut gasket over threads of the retainer.
 - c. Place the filter spring in the filter recess of the carburetor fuel inlet and hold in place.
 - d. Place the new filter against the spring, with the cone end pointing out and hold in place.
 - e. Install the retaining nut with gaskets, and torque to specification (Fig. 29).
 - f. Verify correct installation of spring and filter by pushing against filter with a small screw driver. If spring tension is not holding filter against seat, the spring is not assembled correctly. Repeat Steps a thru f.
5. Reinstall fuel line, start engine and check for leaks.



A4835-1A

FIG. 29 Fuel Filter Replacement

D-8: AIR CLEANER TEMPERATURE CONTROL CHECK

A. Thermostat Operated System Without Vacuum Override Water Immersion Test

1. Disconnect duct and valve assembly from air cleaner, if necessary, zip tube and heat riser tube and remove.
2. Check duct door for freedom of operation. Repair or replace as required.
3. Insert duct and valve assembly in water so that the bulb end of wax pellet is submerged and check for operation of duct door as follows:
 - a. With water temperature between 90-105°F, the duct door should be closed. If the duct door

is not closed within five minutes, replace duct and valve assembly.

- b. With water temperature between 130-150 °F, the duct door should be open. If the duct door does not open within five minutes, replace the duct and valve assembly.
4. Reinstall duct and valve assembly to air cleaner and reconnect system components.
CAUTION: The duct and valve assembly must be completely dry before reinstallation.
5. Inspect zip tube and heat riser tube for proper installation and/or damage. Repair or replace as required.

B. Vacuum Operated Systems Check

CAUTION: This check must be performed in ambients of not less than 60 °F. Do not immerse any part of the vacuum operated duct and valve assembly in water.

1. Duct and Valve Functional Check

NOTE: On vehicles equipped with a cold weather modulator or vacuum delay valve, by-pass the modulator or delay valve by connecting the two vacuum lines together.

- a. Apply parking brake and block wheels.
- b. Remove the air cleaner cover and element. Inspect heat riser tube and zip tube for proper installation and/or damage. Repair or replace as required.
- c. Remove items necessary to see the duct door.
- d. Look to see that the duct door is open (heat off, no vacuum), position when the engine is not running. If the duct door is closed, check for binding and sticking. Repair or replace as required.
- e. Place a magnetic based temperature indicator (Kent-Moore J22973 or equivalent) as near as possible to the temperature sensor on the air inlet side.

NOTE: Do not allow the temperature indicator magnet to touch the temperature sensor.

If the air cleaner is aluminum, loop a piece of electrical or masking tape (adhesive side out) and press it against the temperature indicator magnet. Press the tape and the indicator against the air cleaner, as near as possible to the temperature sensor on the air inlet side.

- f. Start the engine. If the duct door is closed proceed to step g. If the duct door is not closed, turn off the engine. Cool the temperature sensor by spraying with liquid from a small can of R-12 refrigerant and a ZRE-6271 or equivalent can adapter for 20 seconds after liquid contacts sensor.

CAUTION: Do not cool the temperature sensor while the engine is running. If R-12 refrigerant is drawn into the carburetor while the engine is running, poisonous phosphene gas will be exhausted into the test area. Conduct this procedure in a well ventilated area only.

Restart the engine. If the duct door is closed, proceed to Step g. If duct door is open during idle, check related vacuum system per Section C.

- g. Reinstall the air cleaner cover without installing the wing nut.
- h. With the engine running, observe the duct door and record the time. It should start to open within 5 minutes. If the door does not start to open within the 5 minute period, remove the air cleaner cover and note the temperature.
 1. If the temperature is greater than 110 °F, replace the sensor.
 2. If the temperature is less than 110 °F, the temperature is insufficient to operate the duct door. Reinstall the air cleaner cover without installing the wing nut and run the engine for an additional 5 minutes. If the duct door has not started to open, replace the sensor.
- i. Turn off the engine. Remove all test instruments and reinstall system components. Torque carburetor wing nut(s) to specification.

C. System Component Check Proceed as Follows:

1. Check air cleaner vacuum system integrity. Repair or replace as required.
2. Check the duct door for sticking or binding by depressing with fingers and allowing the internal vacuum motor spring to return the door to the normal position. Correct any sticking or binding before proceeding with the test.
3. Disconnect the vacuum hose from the vacuum motor connector tube.
4. Using an external vacuum source, apply a minimum of 16" Hg. vacuum and trap. The vacuum motor should remain closed for 60 seconds. If not, replace the duct and valve assembly.

D. Thermostat Operated System with Vacuum Override

CAUTION: DO NOT WET OR IMMERSE ANY PORTION OF THE VACUUM MOTOR IN WATER.

1. Disconnect duct and valve assembly from the air cleaner, if necessary, all hoses, ducts or other components and remove.
2. Check duct door for freedom of operation. Repair or replace as required.
3. With ambient temperature less than 73 °F, connect an external vacuum source directly to connector of the vacuum motor and proceed as follows:
 - a. At Zero vacuum on the vacuum motor, the duct door must be within 0.60 of an inch or less of being in the heat-off position. If the door is not in this position after ten minutes, replace the duct and valve assembly.
 - b. With application of 1-5 in. Hg. input vacuum to the vacuum motor; the duct door should start to move toward the heat-on position. If this condition is not met, repair or replace as required.
 - c. With application of 7-12 in. Hg. input vacuum to the vacuum motor; the duct door should be

in the heat-on position. If the duct door is not in this position within one minute, repair or replace as required.

CAUTION: Do not allow vacuum to drop below 17 in. Hg. or rise above 12 in. Hg. while performing the following test:

- d. Insert duct and valve assembly in water so that the bulb end of the thermostat is submerged in water and check operation of duct door.
 - e. With water temperature at 50-60°F, the duct door should be in the heat-on position. If the duct door is not in this position within 10 minutes, replace the duct and valve assembly.
 - f. With water temperature at 102-130°F, the duct door should start to move toward the heat-off position within 10 minutes, repair or replace as required.
4. Remove duct and valve assembly from water and disconnect vacuum source from vacuum motor.
CAUTION: THE DUCT AND VALVE ASSEMBLY MUST BE COMPLETELY DRY BEFORE REINSTALLATION.
 5. Reinstall duct and valve assembly to air cleaner and reconnect system components.
 6. Inspect all components for proper installation and/or damage. Repair or replace as required.

Charging System

**PART
50-31**

APPLIES TO ALL MODELS

SUBJECT	PAGE	SUBJECT	PAGE
MAINTENANCE		MAINTENANCE (Cont'd.)	
Alternator and Voltage		Jump Starting	50-31-1
Regulator Operation	50-31-2	State of Charge (Open	
Alternator Drive Belt Tension	50-31-2	Circuit Voltage)	
Battery	50-31-1	Maintenance Free Battery	50-31-2
Battery Cables	50-31-2	PRE-DELIVERY	50-31-1
Charging System Tests	50-31-2	SPECIFICATIONS	50-31-2
Electrical Connections	50-31-2		

PRE-DELIVERY

Refer to Part 50-02

MAINTENANCE BATTERY

DANGER-EXPLOSIVE GASES —Batteries produce explosive gases. Keep sparks, flame, cigarettes away from the battery. When charging or using in an enclosed area, make sure there is adequate ventilation near batteries. Always wear eye protection when working near batteries.

POISON—CAUSES SEVERE BURNS —The battery contains sulphuric acid. Avoid contact with skin, eyes, or clothing. Shield eyes when working near the battery to protect against possible splashing of the acid solution. Antidote: Flush affected areas with water. EYES: Flush with water for 15 minutes and get prompt medical attention. INTERNAL: Drink large amounts of milk or water. Follow with Milk of Magnesia, beaten egg, or vegetable oil. Call physician immediately. Keep out of the reach of children.

JUMP STARTING

When starting vehicles with another battery and jumper cables, the following instructions should be followed to prevent sparks at the battery terminals and to prevent damage to other electrical components of the vehicles:

1. Be sure that all switches are in the OFF position.
2. Shield eyes. Use safety goggles or similar eye protection.
3. Connect ends of one cable to positive (+) terminals of each battery.

4. Connect end of the other cables to negative (-) terminal of good battery.
5. Connect other end of cable to engine bolthead or similar good contact spot on the vehicle being started (NOT to negative (-) terminal of battery).
6. To prevent damage to other electrical components of vehicle being started make certain that engine is at idle speed before disconnecting jumper cables.

Note: 12 volt starting motors can be damaged beyond repair if connected to a 24-volt power supply (two 12-volt batteries in series, or a 24-volt motor-generator set), even when cranking loads are relatively light. Extensive starting motor damage is more likely if the starter is connected to a 24-volt supply while being subjected to prolonged heavy cranking loads such as attempting to start an engine in subzero temperatures.

Note: Batteries are heavy, weighing 25 lbs. or more. Lift them with your legs rather than your back to prevent muscle strains, and be careful not to drop them (possible breakage) nor to spill the contents (sulphuric acid).

FLUID LEVEL—NON-MAINTENANCE FREE BATTERIES

On non-maintenance free batteries keep the fluid in each battery cell up to the level of the ring in the bottom of the filler well. Generally tap water may be added unless it has a high mineral content. If tap water is

unsuitable for these reasons, distilled water should be used.

The maintenance free batteries do not require the addition of water during normal service life.

BATTERY CHARGE—NON-MAINTENANCE FREE BATTERY

With battery temperature at 26 °C (80 °F) the battery should have a specific gravity reading of not less than 1.230. If the battery requires charging, refer to the specification chart in this section for battery charging rates.

STATE OF CHARGE (OPEN CIRCUIT VOLTAGE) MAINTENANCE FREE BATTERY

With the engine off, turn headlights on for 10 seconds and wait for five minutes to stabilize the battery. Place voltmeter leads on the battery. Place voltmeter leads on the battery terminals and check for open circuit voltage. The minimum open circuit voltage is 12.45. If the battery is below 12.45 open circuit voltage, recharge according to the allowable battery charge time schedule for maintenance free batteries. Do not exceed a 30 amp charge rate. If gassing or spewing of the electrolyte occurs during charging, the charge rate must be reduced.

BATTERY CABLES

Check battery cable connections for tightness. Battery cables must be tight in terminals and terminals tight to posts after installation. A light coating of high temperature grease can be applied to terminals and posts to retard corrosion.

ALTERNATOR DRIVE BELT TENSION

Refer to the Maintenance Section of Part 50-29 Emission Control Systems.

ALTERNATOR AND VOLTAGE REGULATOR OPERATION

Turn the headlights ON and check the charge indicator gauge or light to be sure charging system is not discharging. If system is discharging, check and repair as necessary. Refer to Part 31-01, Charging System General Service.

ELECTRICAL CONNECTIONS

Starting problems are often traceable to loose or corroded battery connections.

1. If battery terminals are corroded, remove cable clamps from the terminals and scrub battery, terminals and surrounding area with a solution of baking soda and water. Use a plastic brush that is impervious to acid. Wash off the residue from the battery and surrounding areas with clean water. After cleaning, brush the battery terminals and the inside of the cable clamps with a wire terminal brush. Coat all corroded areas and terminals with high temperature grease after installation.
2. Keep connections clean and tight. Prevent wire and lugs from touching each other or any metal except screw terminals to which they are attached.
3. Replace broken or worn wires and their terminals.
4. Have battery tested periodically.

CHARGING SYSTEM TESTS

Check the alternator drive belt and adjust it to specification before proceeding with any tests. Refer to Part 31-01, Charging System General Service for instructions.

SPECIFICATIONS

ALLOWABLE BATTERY HIGH RATE CHARGING TIME SCHEDULE

Open Circuit Voltage	Charge Rate Amperes	Battery Capacity — Ampere Hours Charging Time — Hours					
		36	45	54	63	71	81*
Below 11.90	20	2.0	2.5	3.0	3.5	4.0	4.5
11.90-12.05	20	1.75	2.25	2.75	3.25	3.5	4.0
12.05-12.15	20	1.50	1.75	2.0	2.5	2.75	3.25
12.15-12.30	20	1.0	1.25	1.5	1.5	1.75	2.25
12.30-12.40	20	30 Min.	35 Min.	40 Min.	45 Min.	50 Min.	1.25
Above 12.40	5	1.25	1.75	2.0	2.25	2.5	3.0

*All batteries except 81 ampere-hour are maintenance free.

If gassing or spewing of the electrolyte occur during charging, the charge rate must be reduced. Battery must be at a temperature of at least 40°F before charging.

The preferred method of charging maintenance free batteries is to use a charge specifically designed to maintain charging rates within 59 limits to prevent excessive gassing and spewing of electrolyte.

ALTERNATOR — G.P.D.

Identification Plate Color	Slip-Ring Turning				Brush Length				Pulley Nut Torque		Belt Tension	
	Min. Diameter		Max. Runout		New		Wear Limit		N•m	(ft-lbs)	N•m	(ft-lbs)
	MM	Inch	MM	Inch	MM	Inch	MM	Inch				
Orange	30.98	1.22	0.0127	0.0005	12.70	½	4.76	3/16	82-134	60-100	95-149	70-110
Green	30.98	1.22	0.0127	0.0005	12.70	½	4.76	3/16	82-134	60-100	95-149	70-110
Black	30.98	1.22	0.0127	0.0005	12.70	½	4.76	3/16	82-134	60-100	95-149	70-110
Red	30.98	1.22	0.0127	0.0005	12.70	½	4.76	3/16	82-134	60-100	95-149	70-110

Used Belt — New Belt 203 N•m (150 ft-lbs). A used belt is one that has been in operation for 10 minutes or more. If belt tension is not within specifications, or belt has been removed, reset to 149 N•m (110 ft-lbs).

ALTERNATOR — G.P.D. (continued)

Identification Plate Color	Rating		Field Current Amps @ 12v
	Amperes @ 15V	Watts @ 15V	
Orange	40	600	4.0
Green	60	900	4.0
Black	65	975	4.0
Red	100	1500	4.0

SPECIAL TOOLS

Ford Tool No.	Description
T63L-8620-A	Belt Tension Gauge
T65P-10300-B	Alternator Pulley Remover

CJ1460-2H

Lights, Instruments, Controls, Heating, Air Conditioning and Accessories

**PART
50-32**

APPLIES TO ALL MODELS

SUBJECT	PAGE	SUBJECT	PAGE
LUBRICATION		MAINTENANCE (Cont'd.)	
Ignition Lock	50-32-2	Heater and Defroster Operation	50-32-1
Speedometer Cable	50-32-2	Horn, Windshield	
Tachometer Adapter —		Wipers and Washers	50-32-1
C- and LN-Series	50-32-3	Speedometer, Odometer	
Tachometer Cable	50-32-3	and Tachometer	50-32-1
MAINTENANCE		Windshield Washer	
Air Conditioner Operation	50-32-2	Reservoir Fluid Level	50-32-1
Cigar Lighter	50-32-1	Windshield Wiper Blades	50-32-1
Fresh Air Vents	50-32-2	PRE-DELIVERY	50-32-1
Headlight Alignment	50-32-1		

PRE-DELIVERY

Refer to Part 50-02.

MAINTENANCE

WINDSHIELD WIPER BLADES

Wiper blade replacement intervals will vary with use, type of weather, road tars or salt reaction and age of blades. Be sure windshield glass surface is not contaminated with oil, tree sap or other foreign substance which cannot be easily rubbed off.

Generally, if the glass is still dirty and streaked after wiping, the blades should be replaced.

WINDSHIELD WASHER RESERVOIR FLUID LEVEL

In warm weather, fill the reservoir with water and enough windshield washer solvent to act as a detergent.

In winter, maintain sufficient concentration of solvent to prevent freezing (consult individual container for exact proportions). Frozen solution will not function and may damage reservoir.

HEADLIGHT ALIGNMENT

Check the headlights for proper alignment. If necessary, align the headlights using the Headlight Aiming Kit—Model T.R.E. 540 or equivalent. Be sure to use the latest manufacturers instructions.

SPEEDOMETER, ODOMETER AND TACHOMETER

Check; then, lubricate and tighten cable connections if needle bounce is found.

HORN, WINDSHIELD WIPERS AND WASHERS

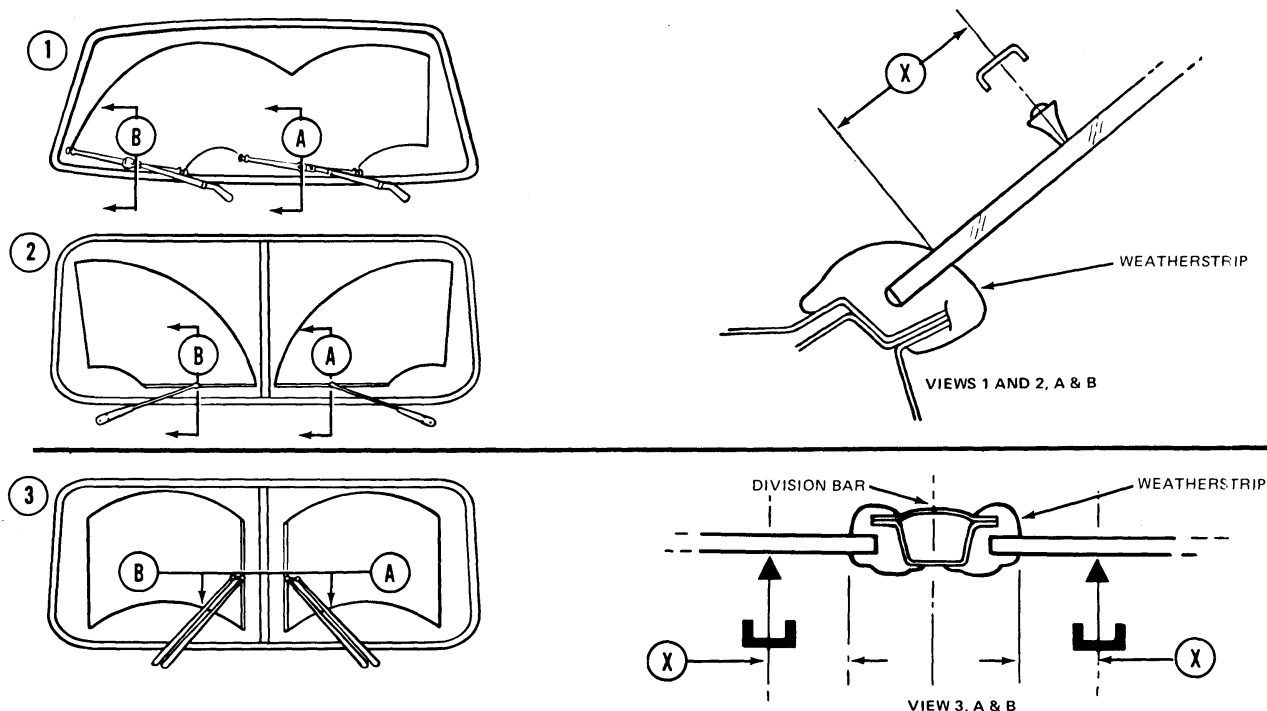
Check proper cycle and park (Fig. 1). Adjust if required (refer to the appropriate Part in Group 35).

CIGAR LIGHTER

If lighter is inoperative, be sure the wire is connected to the light socket.

HEATER AND DEFROSTER OPERATION

Place selector lever in HEAT position. Move blower switch through each speed position and check for corresponding change in air discharge at outlets. Move temperature control lever through entire range and check for proper change in discharge air temperature. Repeat this procedure in DEFROST position and check for air discharge through defroster nozzles.



Vehicle	View	Dimension 'X'			
		Driver's Side		Passenger Side	
		MM	Inch	MM	Inch
C-Series (Para-Wipe)	3	44.45-69.85	1.75-2.75	44.45-69.85	1.75-2.75
C-Series	2	25.40-50.80	1.00-2.00	25.40-50.80	1.00-2.00
L-Series		50.80-85.85	2.00-3.38	38.10-72.89	1.50-2.87
E-100-E-350	1	69.85-107.95	2.75-4.25	82.55-120.65	3.25-4.75
F-Series, Bronco	1	62-93	2.44-3.66	62-93	2.44-3.66

K3201-2E

FIG. 1 Wiper Arm and Blade to Dimension "X"

AIR CONDITIONER OPERATION

Place function selector lever in A/C and the temperature selector in COOL. Increase engine speed to approximately 1500 rpm E-Series. After approximately one minute, check the sight glass. A continuous or large amount of bubbles during compressor operation indicates a refrigerant undercharge. If an undercharge is found, check and repair any leaks, evacuate the system, and charge with the proper amount of refrigerant-12. If the sight glass is clear, a cold suction tube at the compressor indicates

that the system is working properly. F-Series, Bronco and E-Series: after approximately one minute, check for cool air discharge at each A/C register in each blower speed position. Also, check register(s) for direction and volume control. Check temperature modulation by moving control lever slowly to WARM position. Return lever to COOL position.

FRESH AIR VENTS

Check all vents by operating vent controls.

LUBRICATION

IGNITION LOCK

Check for ease of operation by inserting key and turning to all positions. Remove key and lubricate ignition lock cylinder, if necessary, with the specified lock lubricant, D8AZ-19587-A or equivalent. Insert key and operate several times to be sure lubricant has been worked in. Remove key and wipe off any excess lubricant.

SPEEDOMETER CABLE

1. Disconnect the speedometer cable from the speedometer.
2. Pull the core out of the casing.
3. Wash all old lubricant from the cable. Wipe dry.
4. Apply a thin film of specified Speedometer Cable Lubricant, D2AZ-19581-A or equivalent to the cable.

5. Insert the core in the casing.
6. Connect the cable to the speedometer.

TACHOMETER CABLE

1. Disconnect the tachometer cable from the tachometer head.
2. Pull the core out of the casing.
3. Wipe off all the old lubricant from the cable and apply specified Speedometer Cable Lubricant, D2AZ-19581-A or equivalent sparingly.

4. Install the core in the casing and connect the cable to the tachometer head.

TACHOMETER ADAPTER—C AND LN SERIES

Disconnect the cable housing at both ends of the adapter. Daub the cable ends liberally with Ford Polyethylene grease (DOAZ-19584-A) or an equivalent and insert them into the adapter. Reconnect the cable housing.

Body		PART 50-41	
APPLIES TO ALL MODELS			
SUBJECT		SUBJECT	
PAGE		PAGE	
LUBRICATION		PRE-DELIVERY 50-41-1	
Cab Latch Mechanism (C-Series) 50-41-1		SPECIFICATIONS 50-41-1	
Lock and Pivot Points 50-41-1			
MAINTENANCE			
Clean Body and Door			
Drain Holes 50-41-1			

PRE-DELIVERY

Refer to Part 50-02.

LUBRICATION

LOCK AND PIVOT POINTS

To eliminate any binding conditions on pivot and friction points, spray polyethylene grease D7AZ-19584-A or equivalent on hood hinges, auxiliary catch and latch; door hinges, hinges check, rotor and striker plate, seat back latches, and on the tailgate hinges. Operate all pivot points several times to be sure lubricant has been worked in.

Also, apply lock lubricant to the lock cylinders, including the ignition lock, and insert and turn key several times to work in the lubricant.

See Part 50-03 Lubrication Guides and Lubricant Specifications for lubricant specifications.

CAB LATCH MECHANISM (C-SERIES)

Lubricate the lock handle linkage and locking cams with 10W oil at all pivot points. Operate the mechanism to work the lubricant into all points.

MAINTENANCE

CLEAN BODY AND DOOR DRAIN HOLES

Drain holes, located along the bottom surface of the door and side panels, should be inspected periodically for obstructions. A practical time for inspection is

whenever vehicle is washed. Use a small screwdriver or similar tool to clean drain holes.

SPECIFICATIONS

FRONT BUMPER BOLT TORQUE

M12 (Beauty Bolts)	17-23 ft-lbs (23-31 N•m)
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INDEX

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